

The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 27, No. 1

Association of Electragists
INTERNATIONAL

NOVEMBER, 1927

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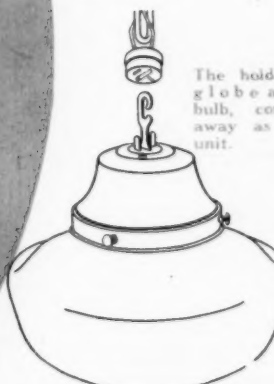
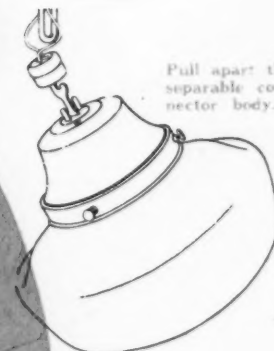
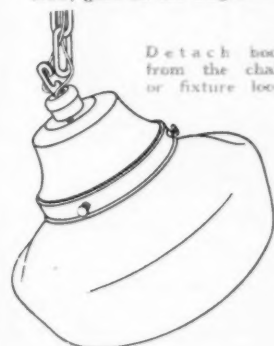
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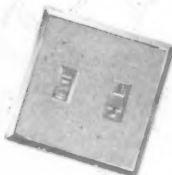
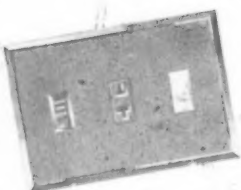
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Vol. 27

NOVEMBER, 1927 — Oct. 1928

No. 1 — 12

X969509 Table of Contents:

Drive Starts on Unwired Homes.....	19
Estimating Methods—IV.....	Arthur L. Abbott 24
Answers to Fundamental Grounding Questions.....	28
Remodeling to Replace New House Construction.....	29
Unfair Specifications.....	L. E. Mayer 31
Latest Development in Trough Wiring.....	32
Mechanical Installations of Motors and Control—II.....	34
Payroll Handling on Near and Distant Work.....	38
Code Chats.....	F. N. M. Squires 39
Editorials	42
Association List.....	44
October Activities.....	46
Manufacturing News.....	52

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Vol. 27

DECEMBER, 1927

No. 2

Table of Contents:

What Constitutes a Motor Specialist?.....	Frank T. Broiles 19
Inventory Taking Methods.....	21
Perpetual Inventory for Motor Shop.....	23
Jobbers Can Help The Electragists.....	Clyde L. Chamblin 24
A Way to Sell More Fixtures by Mail.....	26
Estimating Methods—VI.....	Arthur L. Abbott 28
Market Development Through Better Retail Outlets.....	Laurence W. Davis 31
Problems Involved in Using Circuit Wire for Grounding.....	D. Hayes Murphy 33
Jobbers Recommend Ways to Reduce Costs.....	34
How Much Fusing Is Needed?.....	F. N. M. Squires 35
Chats on the National Electrical Code.....	F. N. M. Squires 36
Ninety Store Lighting Contracts.....	R. B. Kellogg 38
Editorials	40
Association List	42
November Activities	44
Manufacturing News	51

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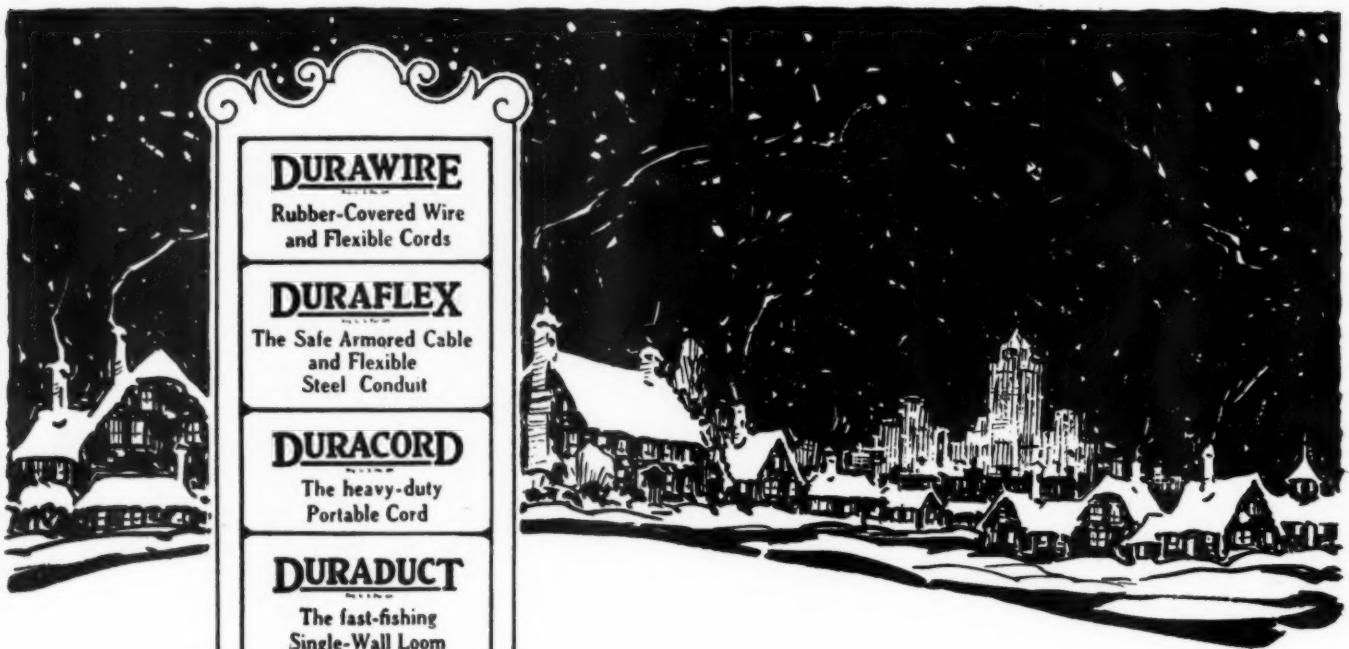
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Vol. 27

JANUARY, 1928

No. 3

Table of Contents:

The Enemy Within the Gates.....	S. B. Williams	19
Advertising the Motor Shop—I.....	Harr F. Ranney	21
Protective Grounding.....	W. M. Runyon	25
Grounding of Portables.....	W. J. Canada	27
Wiring Standards Must Be Protected.....	A. Penn Denton	28
Lighting for Safety.....		29
Plan of Electragist Standards for Wiring Installations.....		30
Estimating Methods—VII.....	Arthur L. Abbott	32
European Wiring Practice.....	F. D. Weber	36
Tentative Rules on Metallic Tubing.....		37
Rules for Perfecting Mechanic's Lien.....	Leo T. Parker	39
Chats on the National Electrical Code.....	F. N. M. Squires	40
Editorials		42
Association List		44
December Activities		46
News of the Manufacturers.....		54

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Vol. 27

FEBRUARY, 1928

No. 4

Table of Contents:

"APPROVED," What Does It Mean?.....	S. B. Williams	19
Selling Garage Wiring Jobs by Mail.....		20
Hazard of Grounding to Circuit Wiring.....	S. W. Borden	21
Cost to Install Apartment House Meters.....		25
Laniape!		27
Analysis of Proposed 1928 Code Revisions.....	Arthur L. Abbott	28
Advertising the Motor Shop—II.....	Harr F. Ranney	31
Electrical Industry Wants Better Fusing.....	F. N. M. Squires	34
Estimating Methods—VIII.....	Arthur L. Abbott	35
Cooperation Sells Wiring, Fixtures and Appliances.....		39
Chats on the National Electrical Code.....	F. N. M. Squires	40
Editorials		42
Association List		44
January Activities		46
Manufacturers' Notes		52

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Vol. 27

MARCH, 1928

No. 5

Table of Contents:

Saving \$1.71 at a Cost of \$505.89.....	F. H. Tathwell 19
Improved Designs for Stage Lighting Equipment.....	21
Accounting for Work in Progress.....	23
Electrical Shaftway Practice.....	24
Progress Toward New Code.....	25
Volumitis.....	E. Con Tractor 30
Estimating Methods—IX.....	Arthur L. Abbott 31
Wiring Depreciates As Well As Anything Else.....	E. A. Artz 34
Central Station Advertises Contractors.....	36
What Must Be Done About the Motor Business.....	37
Code Chats.....	F. N. M. Squires 40
Editorials	42
Association List	44
February Activities	46
Manufacturers' Notes	52

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Technical Director, A. E. I.

Vol. 27

APRIL, 1928

No. 6

Table of Contents:

Stop Bid Peddling.....	19
Well-Rounded Advertising Policy Increases Motor Business.....	20
Adequate Wiring Data for Lighting Circuits.....	21
Collections—I	Harr F. Ranney 22
Where Electragists Will Meet.....	25
Job Management.....	Robert A. Goeller 26
Who Said Business Is Bad?.....	31
Estimating Methods—X.....	Arthur L. Abbott 33
Selling More Show Window Jobs by Demonstration.....	36
Advertising the Red Seal Contractor.....	37
The Legal Effect of Cost Plus Contracts.....	Leo T. Parker 39
Wiring an Apartment for Radio.....	41
Chats on the National Electrical Code.....	F. N. M. Squires 42
Editorials	44
Association List	46
March Activities	48
Manufacturers' Notes	54

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Vol. 27

MAY, 1928

No. 7

Table of Contents:

Labor Waste	S. B. Williams	19
An Invoice That Prevents Arguments.....		20
Collections—II.	Harr F. Ranney	21
California Plans to Arbitrate		23
A Motor Specialist Can Make Money!.....		24
Distinctive Advertising by the Use of Color.....		25
Taking Industrial Business from the Jobber.....	M. S. MacNaught	26
The Electrical Inspector.....	Victor H. Tousley	31
Written vs. Oral Agreements.....		32
Estimating Methods—XI	Arthur L. Abbott	33
Obsolete Laws Retard Electrical Progress.....	Harry B. Kirkland	35
American Wiring Practices vs. European.....		36
Chats on the National Electrical Code.....	F. N. M. Squires	37
Biggest Electrical Exhibit Planned		40
Editorials		42
Association List		44
April News		46
Manufacturers' Notes		53

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Vol. 27

JUNE, 1928

No. 8

Table of Contents:

To the Editor.....	19
Courage of Salesmanship.....	Laurence W. Davis 21
Saving Bends With Concrete Duct.....	23
Letterheads.....	24
Analysis of 1928 Code Changes	26
Credit.....	J. J. O'Reilly 32
\$6,000 for \$20.....	Fice Mork 34
Estimating Methods—XII.....	Arthur L. Abbott 35
Advertising Convenience	37
How to Sell Motors.....	A. C. Huntley 38
All Roads Lead to Chicago.....	40
Chats on the Code.....	F. N. M. Squires 42
Editorials	44
Association List	46
May Activities	48
News of the Manufacturers.....	53

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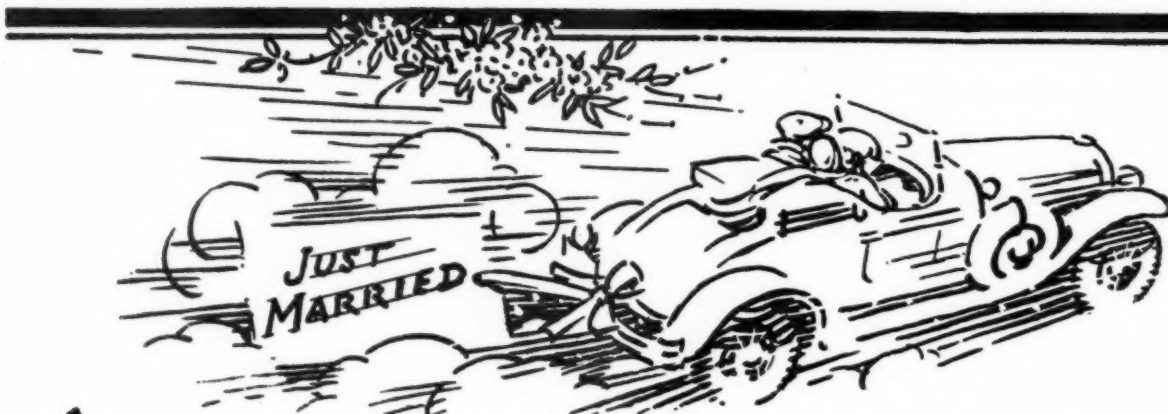
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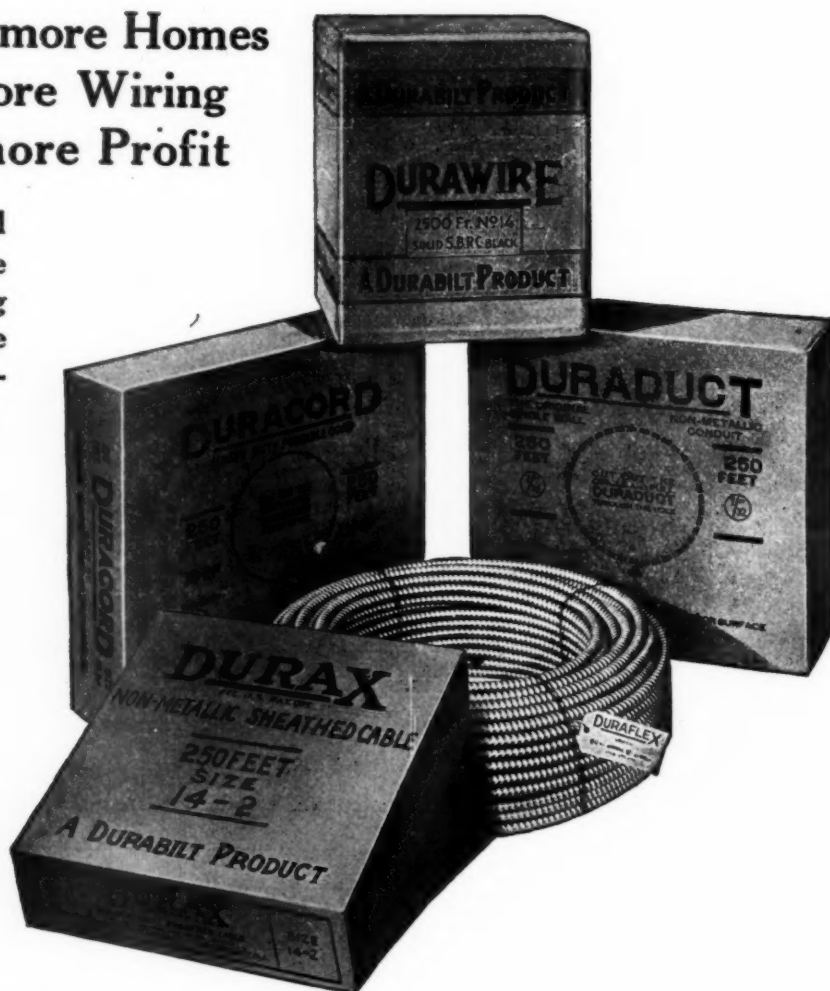
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JULY, 1928

No. 9

Table of Contents:

To the Editor.....	19
Sound Trade Relations.....	Clyde L. Chamblin 21
Follow-Up Aids Collections.....	22
Estimating Methods—XIII.....	Arthur L. Abbott 23
Special Rules.....	Harry B. Kirkland 28
Causes of Non-Approval.....	29
Industrial Sub-stations	30
California Range Wiring Requirements.....	31
Analysis of 1928 Code Changes—II.....	32
Merchandising Principles Defined	36
Eight Towns Standardize Special Requirements.....	37
Building Designed Especially for Contracting.....	38
Committee Chairmen, Electragist Convention.....	40-41
Code Chats	42
Editorials	44
Association List	46
June Activities	48

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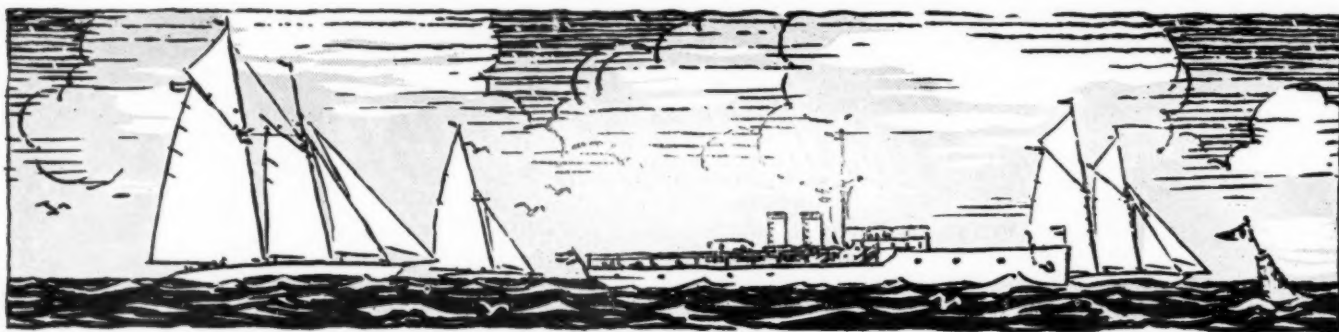
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If You Want Smooth Sailing -

on wiring jobs, use these
Quality Wiring Materials.

► Durabilt Products are
helping Electrical Contrac-
tors, everywhere, to do the
best wiring jobs with the

*Greatest
Possible
Speed*



DURAWIRE
Rubber-Covered Wire
and Flexible Cords

DURAFLEX
The Safe Armored Cable
and Flexible
Steel Conduit

DURACORD
The heavy-duty
Portable Cord

DURADUCT
The fast-fishing
Single-Wall Loom

DURAX
The Non-Metallic
Sheathed Cable
of Known Quality

Order Durabilt Products
by name from your Jobber

DURABILT
REG. U.S. PAT. OFF.
PRODUCTS

*So
speed up
wiring
jobs*

TUBULAR WOVEN FABRIC COMPANY, PAWBUCK, ILL.

The Electragist

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

HARR F. RANNEY
Associate Editor

EDITORIAL ADVISORY STAFF

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Member Electrical Committee N. F. P. A.

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Vice President Hatzel & Buehler, Inc.

ESTIMATING
Arthur L. Abbott, E. E.
Technical Director, A. E. I.

Vol. 27

AUGUST, 1928

No. 10

Table of Contents:

Letters to the Editor	19
Motor Repair Men	21
Accounting Forms Tell a Story	22
Estimating Methods—XIV	24
What Should a Contractor Earn	28
Why Inspectors Refuse to O. K. Jobs	30
Overhead	32
Analysis of 1928 Code Changes—III	35
The Five Day Week	41
Code School for Mechanics	43
Status of Conduit Standardization	44
Code Chats	45
Editorials	48
Association List	50
July Activities	52
Manufacturers' Notes	58
Chicago Welcomes the Electragists!	67
Points of Interest	68
Map of Chicago Business Section	69
What to See in Chicago	71
Exhibitors	75
Chicago in Pictures	78
A Symphony of Industry	81
Chicago Electric Association	89
Increasing Home Outlets	93

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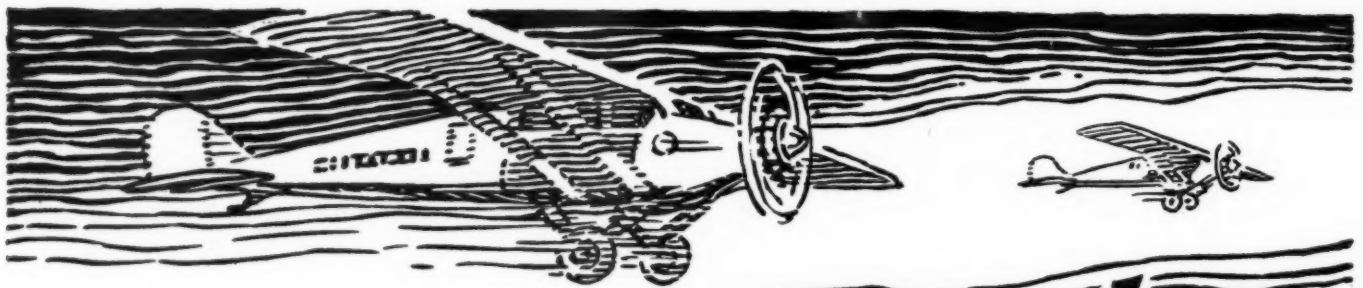
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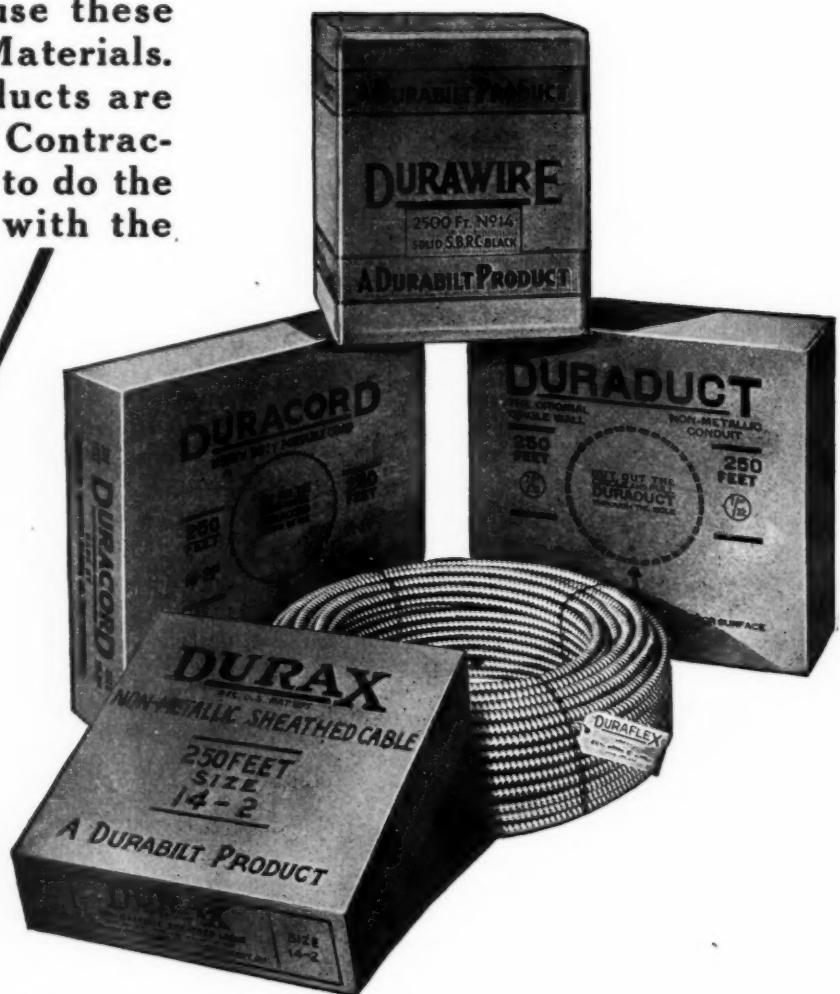


For Profitable Speed -

on wiring jobs, use these
Quality Wiring Materials.

► Durabilt Products are
helping Electrical Contrac-
tors, everywhere, to do the
best wiring jobs with the

*Greatest
Saving
of
Time!*



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Vol. 27

SEPTEMBER, 1928

No. 11

Table of Contents:

Report of Electragist Convention.....	19
A Challenge to Electragists.....	Clyde L. Chamblin 23
Wasted Profits.....	S. B. Williams 24
The New Electrical Code.....	Victor H. Tousley 26
Trade Relations.....	A. Penn Denton 27
Central Stations Can Aid the Contractor.....	28
The New Cooperation.....	L. K. Comstock 30
Central Stations and Contractor Dealers.....	Philip Cabot 33
Credit	Frederic P. Vose 37
The Contracting Business.....	John F. Gilchrist 38
Manufacturers' Exhibit	41
Analysis of 1928 Code. IV.....	42
Motor Distribution Plans.....	45
Editorials	46
Association List	48
August Activities	50
Manufacturers' Notes	56

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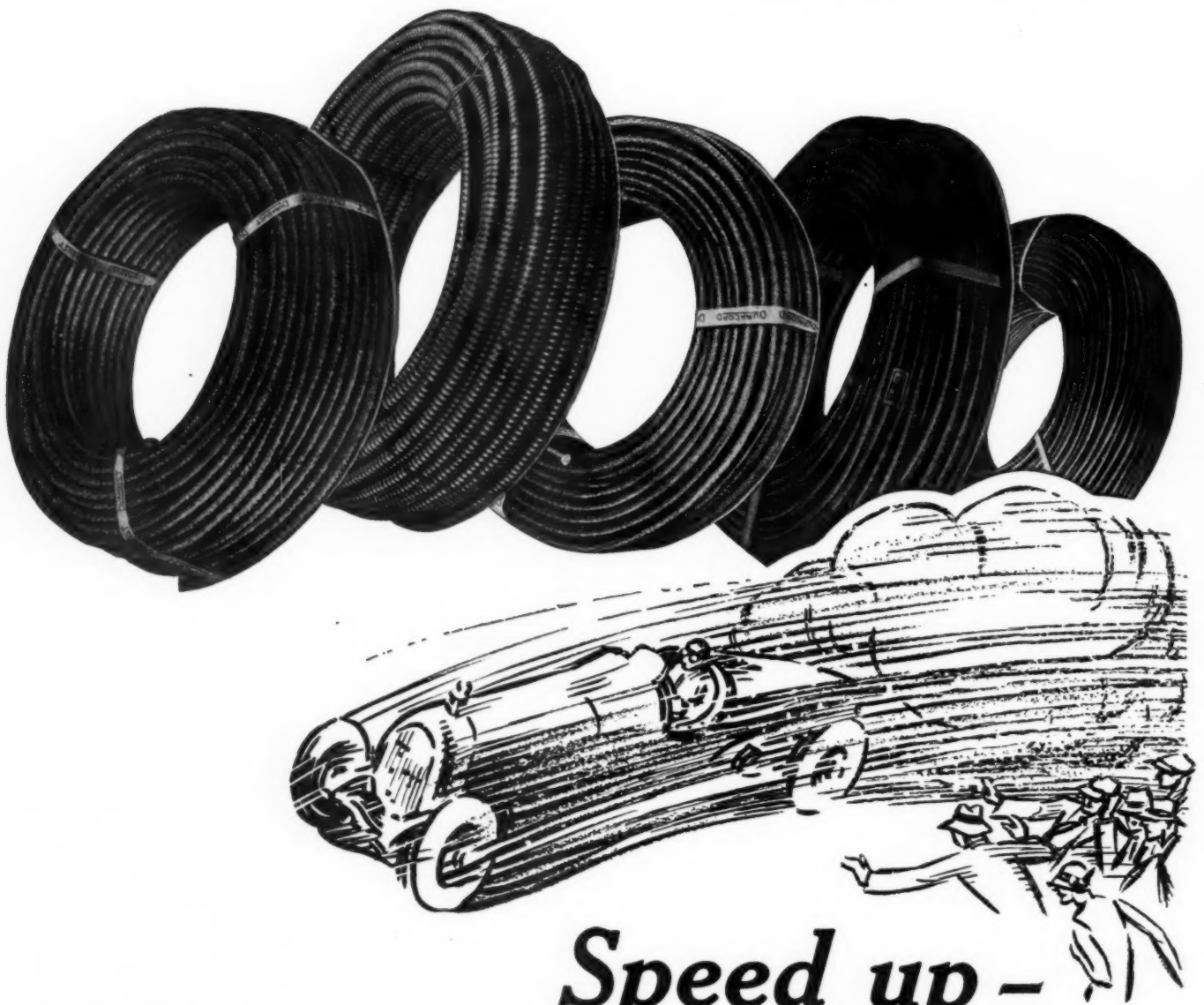
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Speed up -

---- on wiring jobs by using these Quality Wiring Materials. Durabilt Products are helping Electrical Contractors everywhere to do the best wiring jobs with the *Greatest Saving of Time!*

DURAWIRE

Rubber-Covered Wire and Flexible Cords

DURAFLEX

The Safe Armored Cable and Flexible Steel Conduit

DURACORD

The heavy-duty Portable Cord

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Vol. 27

OCTOBER, 1928

No. 12

Table of Contents:

Announcement to Members and Subscribers.....	19
The Legal Right to Replevin.....	Leo T. Parker 20
Maryland Electragists' Engineering Department.....	22
British House Wiring Methods.....	D. S. Munro 23
Direct Mail Advertising is Profitable.....	28
Examination of Supervising Electricians.....	F. D. Weber 29
Loose Leaf Price and Stock Record System.....	33
Trucks	34
Work in Progress Details	35
X-Ray System of Estimating	36
Estimating Methods—XV	Arthur L. Abbott 37
How to Plan an Electrical Convention.....	Earl N. Peak 40
Code Chats	F. N. M. Squires 42
Editorials	44
Association List	46
September Activities	48
Manufacturers' Notes	52

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Here's Our Candidate

—for wiring the "White House" the brown house, or any other building where a quality wiring job is to be done, with the greatest saving of time—assuring a good Profit to the Electrical Contractor.

Durabilt Products
*Speed Up
Wiring
Jobs*



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NOVEMBER, 1927

No. 1

Drive Starts on

Under Wired Homes

Chicago and Cleveland Get Under Way
--- Rochester Ready to Start --- Milwaukee
Making Plans --- Other Cities Interested



PRELIMINARY to the national re-wiring and refixturing drive which is expected to get under way in a few months, Chicago and Cleveland launched their campaign in October and Rochester has about completed its plans and expects to start this month. Milwaukee had its campaign organization meeting on October 20. Other cities are gathering data and will announce plans before the end of the year.

In each instance the activity is carried on by the local electrical league and the work placed with the electrical contractors and dealers.

The plans, which will be given in some detail, fortunately approach the problem from different angles. With the experience so gained the national program will be in a position to make greater progress when it gets started.

Chicago approaches the problem purely from the standpoint of improved lighting, relying on the entree so gained to afford an opportunity for the sale of a rewiring job. Rochester leans equally heavily on the rewiring attack whereas Cleveland and Milwaukee hit from both directions through the medium of house to house check ups.

Each campaign has made a feature of approved lighting equipment and the inclusion of shaded light is very noticeable.

Another feature of the campaigns to date is the easy financing so that the contractors will have their capital liquid at all times and not tied up in

poor accounts. When a contractor's resources are frozen he cannot proceed on new work.

Considerable sums of money will be spent in each locality in advertising. So far only the Chicago and Cleveland advertisements have been worked up.

Samples of these are here reproduced to show the kind of approach. Booklets have been prepared for distribution to the public.

To date, of course, it is too early to have any direct results. Details of the different plans follow:

Chicago Plan Built Around Approved and Tagged Fixtures

GOOD lighting depends upon proper fixtures is the thought that the Electric Association of Chicago is trying to leave with the public in its refixturing campaign. Rewiring is incidental.

The Chicago committee has gone to considerable pains to prepare acceptable fixture specifications. All fixtures that meet these specifications are given a Franklin approval tag. A reproduction of a tag is shown in all of the advertising.

The specifications suggest convenience outlets in the base of all ceiling and bracket fixtures. It will be interesting to note what effect they have on rewiring.

The Chicago people contend that these fixture convenience outlets are necessary because of the large amount of lamp cord wiring in Chicago. It is difficult to see how this type of outlet will improve the situation. In fact, the very ease of lamp cord and wiring by

means of these outlets should increase this fire hazard.

Another recommendation is a twilight switch for dimming all lamps so that there will be a faint glow in the room when not in use. This is suggested because of the security it gives and the protection also against stumbling in the dark.

However, it is facts that are wanted and the Chicago campaign will undoubtedly be fruitful in this connection.

The Chicago advertising is one of demand creating for the contractor-dealers and lighting company. A time payment plan is provided as well as trade-in allowance on old fixtures. The trade-in does not seem to be included in the plans of other cities. The industry should soon be able to know whether this feature should have a place in future fixture selling.

The primary appeal to the public is made from the angle of eyesight con-

with the full page in Chicago newspapers here reproduced. There is another piece of copy that takes four columns the full length of a paper and the remainder are two columns, 5 in. deep. Samples of these are shown also. The

other reproductions are of a window card and the four page booklet for dealer distribution. The truck posters are merely enlargements of the window card. The booklets, window card and tag are red and black.

The dealer in turn must employ at least one more man on his own part for eight consecutive weeks from the start of the campaign.

The salesmen started selling on October 11. At least two weeks, it was expected, were to be devoted to making preliminary calls and building prospect lists. During the first week the men were out they were turning in prospects at the rate of 150 per day and at that time there had been no difficulty securing interviews.

As will be noticed from the sample advertisements shown here the Cleveland plan emphasizes rewiring as well as relighting. The advertising is written to prepare the way for the salesmen, the copy stating that a free survey of one's home lighting and wiring

Cleveland Develops Special Door-to-Door Salesmen

SPECIALLY trained door-to-door salesmen are the backbone of the plan of the Cleveland Electrical League. Under a sales manager with years of experience in door-to-door selling methods, thirty-nine men have been recruited and given a week of intensive training at the Nela Park school. According to the

plan these salesmen are not the dealer's regular men, but special men. These men are paid \$25 a week and 10 percent commission.

Each contributing dealer receives the services of one man whom he pays 10 percent commission, the \$25 fixed wage being paid by participating suppliers.

Special Course in Home Lighting and Wiring

Conducted by the Cleveland Electrical League and the National Lamp Works for the Rewiring and Relighting Campaign Door-to-Door Salesmen

MONDAY, OCTOBER 3

- 9:00-9:30—Registration in the Nela School of Lighting
- 9:30-10:00—Explanation of the Activity and Relation of this Course to it
- 10:00-11:00—Lighting and Wiring Business in Occupied Homes in Cleveland—Quiz
- 11:00-12:00—Visit to the "Well Lighted Home" in the Nela School of Lighting
- 1:15-2:30—Lamps and Electricity
- 2:30-3:30—Visit to Lamp Department Laboratory to see Lamps Made
- 3:30-5:00—Problems in Electricity from the Standpoint of the Home—Quiz
Inspection of other Displays at Nela School of Lighting

TUESDAY, OCTOBER 4

- 9:00-9:45—Light and Vision—Quiz
- 10:00-11:00—Demonstrations in Lighting Research Laboratory
 - a. Principles of Home Lighting
 - b. Light, Shade, and Color
 - c. Modern Electrical Store
- 11:15-12:00—Home Lighting Recipes—Quiz
- 1:15-2:00—The Electrical League Standard of Wiring for New Homes—Quiz
- 2:15-4:00—Blueprint Problem of Laying Out Wiring for New Home
- 4:15-5:00—Discussion of Safe and Unsafe Wiring Practice—Quiz

WEDNESDAY, OCTOBER 5

- 9:00-12:00—Study of Residence Lighting Fixtures
 - Discussion of Type of Fixtures now in Use
 - Discussion of New Type to be Used in Lighting Campaigns
 - General Explanation of Points to be Con-

sidered in Judging Residence Lighting Equipment—Quiz

- 1:15-2:45—Lamp Shade Materials, Shapes, etc.—Quiz
- 3:00-5:00—Sales Drill on Shaded Light Sources, Summary of Arguments and Illustrations for Shading every Lamp Bulb

WEDNESDAY EVENING

- 6:00 P. M.—Electrical Industry Meeting—Electrical League Rooms
Chairman—J. E. North, President, The Electrical League of Cleveland

FIVE MINUTE TALKS BY:

- G. E. Miller, Sales Manager, The Cleveland Electric Illuminating Company
- Maxton R. Davies, Maxton R. Davies Company
"The Newspaper Advertising Program"
- Richard D. Ewing, Standard Acceptance Corporation
"The Financing Plan"
- J. L. Wolf, Lake States General Electric Supply Co., Inc.
"The Viewpoint of the Distributor"
- G. C. Davis, Lakewood Electric Company, President, The Electrical Business Association
"The Viewpoint of the Dealers and the Association's Interest in the Rewiring and Refixturing Campaign"
- P. C. Saxton, Macbeth Evans Glass Company, Chairman, Lighting Section Committee of the Electrical League
"The Merchandising Possibilities of Shaded Light"
- A. B. Wilson, Sales Director of The Electrical League
"How Actual Sales are to be Made in the Field"

Principal Speaker of the Evening—Mr. Earl Whitehorne, Commercial Editor of the *Electrical World*, New York City
"The Next Big Thing to Do"

THURSDAY, OCTOBER 6

- 9:00-10:45—Visit to Unoccupied House
Discussion of Lighting Equipment Found
Sales Arguments to be Considered in Replacement of Old Equipment
- 11:00-12:00—Lighting for Festive Occasions, Holidays and Special Decorations—Quiz
- 1:15-2:00—Demonstration of Selling Better Home Lighting Equipment
- 2:00-2:30—Additional Advantages of Equipment Offered—Quiz
- 2:45-5:00—Selling Points of Campaign Fixtures
Representatives of Manufacturers Will Each Describe his own Equipment

FRIDAY, OCTOBER 7

- 9:00-10:30—Selection of Lighting Equipment for a New Home
- 10:30-11:00—Lighting for Eyesight Conservation—Quiz
- 11:00-11:30—Sales Demonstration
- 11:45-12:15—Home Lighting Playlet "Turn to the Light"
- 1:15-2:30—Visit to Average Occupied Home, Discussion of Equipment in Use, and Opportunity for Sales
- 2:45-4:30—Round Table Discussion of Residential Lighting and Sales Problems Involved

SATURDAY, OCTOBER 8

- 9:00—Entire Class to Report at Electrical League, Fourteenth Floor Statler Hotel
- 9:15—The Central Station Interest in the Program to Promote More Wiring and Better Lighting
- 10:00—Instructions and Assignment

may be had without any obligation.

In this manner the salesmen are able to get into a home and determine the prospect's needs so that the contractor can make a suggestion for modern lighting and an adequate installation of wiring.

A special contract form has been worked up for the time payment contracts. All these contracts add an extra 10 percent for financing. A finance company will handle this paper, advancing the contractor 90 percent of the face value of the contract.

A synopsis of the course prepared for these special salesmen is here given to show kind of instruction these men received preliminary to active door-to-door canvassing.

Unlike Chicago, special lighting equipment specifications were not prepared, but campaign fixtures and glassware must nevertheless meet with approval of the lighting section of the league. Shaded light, of course, is stressed and the salesmen were given special instruction on its value.

During the eight weeks of the campaign participating dealers will keep their stores open until 9 p. m. every evening except Sundays and have at least 75 percent of fixtures on display equipped with approved shades. A portion of the excess light used during the extra hours will be paid for by the league.

The advertising program calls for the expenditure by the league of approximately \$6,000 in 24 sixty column inch advertisements equally distributed through three daily papers, which

*You can replace your Lighting Fixtures
but not your eyes*

re-fixture now

with
FRANKLIN

Approval tag
fixtures



Come In!

Let us show what
they mean to you

SOMETHING NEW

SOMETHING BETTER

SOMETHING DIFFERENT

Two Color Window Card for Chicago Dealers; Same Thing Only Larger Used for Truck Posters

amounts to one advertisement per paper per week. The central station will, in addition, send out letters, folders, broadsides, etc., to a list of around 100,000 residential customers.

The Cleveland Illuminating Company has no merchandising department so that the local plan has had to be built around the contractor-dealer. It will be interesting to compare the results, both as to number of rewired homes and the adequacy of the installations, in places having central station selling with the results in Cleveland. The Cleveland plan is apparently one answer to the problem in everybody's mind, namely, how to get into a house to find out how much rewiring and re-lighting is necessary.

Rochester to Have Dining Room Campaign

Plans for a special campaign for additional wiring and new fixtures are almost completed by the Rochester Electrical League. The advertising is now being prepared.

The lighting part of the campaign will be directed at the dining room in the belief that when the customer has been interested in a new fixture in one room the other rooms will follow. This is another theory that the Rochester campaign should help very materially to prove or disprove.

Fixtures approved for the campaign will be identified by tags. All units will have glass. Also each dealer will

To Our Neighborhood Friends!

If you have read the Chicago newspapers lately, you know about the

FRANKLIN APPROVAL LIGHTING FIXTURES

We Have 'Em!

We cordially invite you to come and see them. They are **Absolutely Different**

These fixtures have been built under the specifications, and have the approval of THE ELECTRIC ASSOCIATION.

They carry the tag shown below:



(DEALER'S OR ELECTRICAL COMPANY'S
NAME AND ADDRESS)

Apartment Renters Re-fixture Now!

The fact that you're a "renter" need not deter you, because we offer:

- 1—DEFERRED PAYMENTS.
- 2—WE REMOVE, WRAP UP AND CAREFULLY store your present fixtures.
- 3—WE REHANG YOUR OLD FIXTURE free on expiration of lease if this occurs within one year.

Landlords!

Modernize and beautify your old apartments

Buy FRANKLIN APPROVAL TAG FIXTURES

A lighted fixture compels more attention than any other furnishing. These particular types enhance furnishings, rest against shabbiness and place everything under a soft, colorful light.

They positively postpone redecoration and certainly cost much less.

FIXTURES WITH THE ARTISTIC EFFECT OF
PORTABLES, WITH GOOD ILLUMINATION

Franklin Type Fixtures are Absolutely Different - Something New Something Better

Look for the Following Features—

- 1—"Twilight" switch on every fixture
- 2—Appliance outlet concealed in every fixture
- 3—"No-Glare" modern stippled glassware
- 4—Lamps entirely concealed
- 5—Washable plated finish

IS DAD A "LIGHT HOG"



Give the family a chance to read, sew, or enjoy themselves. Keep the kids at home.

SPEND A LITTLE ON YOUR HOME

Enjoy your children, radio, books and sewing this winter under

FRANKLIN APPROVAL FIXTURES

You can replace your fixtures but not your eyes!
Are your fixtures glary, sharp, raw? Must your child squirm under a weak, low positioned portable? Is there "paper-shine" and shadow where there should be clear, soft light?

Is Your Home Merely a Cave at Night

THROUGH ATTEMPTING TO LIGHT IT
WITHOUT OVERHEAD FIXTURES?



Save Your Children's Eyesight. Make your Home Cheerful

Does fixture glare cheapen your home?
Does it make the family look haggard and old?



Does this kind of fixture make your apartment look shabby and threadbare? IF SO RE-FIXTURE NOW!

Let the FRANKLIN TAG be your Buying Guide

(DEALER'S OR ELECTRICAL COMPANY'S
NAME AND ADDRESS)

Pages of a Two Color 4-Page Folder Being Distributed to the Public as a Part of Chicago's Campaign



Cleveland's First Rewiring Salesmen Who Are Now Building an Active Prospect List

receive a store certificate listing the fixtures which he has on display as campaign fixtures.

A plan for giving the public price information for additional wiring is being worked out. The committee not wishing to become involved legally has sought legal advice on this point.

One of the best features of the campaign is a financing plan whereby the utility carries all the paper at 6 percent on the unpaid balance which permits the contractor to get all of his money right away. The financing plan applies to minimum sales of \$50 on credits approved by the utility. On unapproved credits the company will carry the paper only if guaranteed by the contractor.

The advertising is planned to cover a period of five weeks. Besides booklets will be distributed to the public.

Milwaukee to Have Salesmen

The Milwaukee Electric League has been making an intensive study of re-lighting campaign plans and on October 20 called its first meeting to consider a local campaign.

The Milwaukee campaign will be carried on through contractor-dealer cooperation, the central station not entering direct but helping in every way to draw business to the contractor-dealers.

An easy payment plan will be worked up, the utility having agreed to carry the paper and collect the accounts with the light bills.

It is planned, if possible, to follow in a measure the Cleveland plan of trained salesmen for the contractor-dealers.

The committee has tentatively accepted the specifications of the Chicago league for lighting equipment as a

working basis. It is not known whether or not they will accept the idea of a convenience outlet in the fixtures.

It is the intention of the local committee to put on a very carefully worked out campaign, but in a modest way in order first to feel out the market and test the plan.

Denver to Have Convenience Outlet Campaign

Plans are taking shape for Denver's convenience outlet campaign which is soon to begin. An advertising campaign will be run in the Denver newspapers in an effort to have the public purchase more convenience outlet installations and the names of members of the Electrical League of Colorado will be signed to the advertisements. The special committee on the campaign, of which E. C. Headrick is chairman, proposed that a minimum of three convenience outlets be installed for a flat price of \$15.85 and that additional ones be put in for \$4.95 each. This price will also apply to the installation of single pole switches.

The campaign will be directed toward home owners. Contractors will not be expected to hold to this price when called upon to install outlets in apartment houses, hotels or stores, but the advertising copy will state that estimates on this type of work will be given cheerfully. The advertisements will likewise point out the necessity of municipal inspection and urge customers to ask for a certificate.

"It should go there but it can't"

EXHAUSTING—can't it—when you can't get that table or lamp or fixture in just the right place? Where it would look best and be best!

In the above picture, there is no electric outlet to which you can attach the necessary table or floor lamp. So you have to put up with a second or third best arrangement.

Such problems never arise in a house that has modern wiring. There are plenty of convenience outlets for all lamps and electric appliances. You can have plenty of light without complexity and dangerous wiring. You can use your vacuum cleaner and other electric aids without searching for a place to attach them.

Free Survey of Your Home Lighting and Wiring

Not a cent charge. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system.

The Electrical League of CLEVELAND
Best Starter on Prospect 3466

"If they don't take these steps—You Do"

STEP SAVING—what's what they really are — your electric procedure. Lower, safer, more, efficient, modern and electric. They are the modern rules of electric lighting and wiring. And they are the rules that you must follow. You may as well not have them unless you have electric outlets to match them to. Four outlets and coil outlets. And few houses have enough of them.

Perhaps your house or apartment was built long ago in the modern wiring and lighting. Perhaps there was a single outlet of your house in a new one. But that is no reason why you should endure inconvenience and unsatisfactory single outlet wiring.

Free Survey of Your Home Lighting and Wiring

Not a cent charge. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system.

The Electrical League of CLEVELAND
Best Starter on Prospect 3466

"If I only had a Kitchen like That!"

THERE'S something wrong with your kitchen unless it is wired by your friends. It is no easy, nowadays, to have a kitchen of shining brightness and modern convenience. But first it must have modern wiring, with plenty of outlets for light and appliances.

Modern wiring makes possible an extra light over the sink, so that you can always see what you are doing, instead of working in your own shadow. Modern wiring permits you to use an electric refrigerator, kitchen mixer, electric cooker, dish washer, ventilator. What kind of wiring have you?

Free Survey of Your Home Lighting and Wiring

Not a cent charge. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system. We will tell you the best way to get the most out of your electric system.

The Electrical League of CLEVELAND
Best Starter on Prospect 3466

"Hang the ceiling Fixture 57 inches from your toes"

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The Electrical League of CLEVELAND
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Four of the Twenty-four Cleveland Advertisements, Each Sixty Column Inches

Estimating Methods---IV

Exposed Conduit Runs
Approximating
Large Wire

Riser Quantities
Power Branch Circuits
Forms

By ARTHUR L. ABBOTT

Technical Director, Association of Electragists, International

IN THE last installment of this series it was shown that the number of elbows, the number of terminations of the conduit at cabinets or fittings and the number of bends must be taken into account in estimating the labor to install conduit.

Supplementing the table published last month, Table 1A contains large pipe labor data for use when the job is large enough to make it worth while to use a motor-driven machine for cutting and threading. All cutting and threading labor being included in the labor units for elbows and terminals, these are the only units affected when the work is done by machine. This data is based on records kept on one job only, and should be confirmed by records from other jobs before it can be considered entirely reliable. However, the records covered all sizes of conduit and the figures were quite consistent, and it is therefore believed that the data in the table may be used without risk of any great error.

It is not at all difficult to count the number of elbows, terminals and bends in any run of large conduit when the work has been carefully laid out. However, this case is more or less common: Wiring is to be installed for a number of motors of small or medium size, no layout is furnished by the customer and not even a building floor plan is available. A few measurements can be taken and a rough sketch can be made from which conduit lengths can be scaled with sufficient accuracy, but the job is not of enough importance to warrant making an accurate drawing merely for use in estimating. There are a large number of elbows, terminals and bends in proportion to the feet of pipe on this kind of work, making it important that they be taken into account, and at the same time it is a slow and unsatisfactory task to try to count these items when estimating from a sketch plan.

Tables 3 and 4 have been made up to provide a practical method of hand-

ling this situation. We find that each run of conduit between two boxes or between a box and a terminal fitting includes on an average about $2\frac{1}{2}$ elbows or bends, and of course 2 terminals. It is therefore possible to compute from Table 1 in the October issue the total labor on a run of any given length, including the necessary number of pipe straps, and the labor per 100 ft. for this run. Then after the total amount of one size of pipe has been determined it is only necessary to find how many runs there are of this size, and to divide the total feet by the number of runs to get the average length of one run. The labor in hours per 100 ft. for this average length is taken from the tables.

TABLE 1A—CONDUIT—FEEDERS AND MOTOR CIRCUITS
Time in hours

Size	Conduit per 100 ft.	Elbows Each		Terminals Each		Bends Each
		Hand Thread	Mach. Thread	Hand Thread	Mach. Thread	
$\frac{1}{2}$	1.7			.2	.2	.08
$\frac{3}{4}$	2.3			.2	.2	.09
1	3.3	.8	.8	.25	.25	.2
$1\frac{1}{4}$	4.3	1.3	1.1	.4	.3	.5
$1\frac{1}{2}$	4.9	1.5	1.3	.5	.34	.6
2	6.1	2.0	1.6	.6	.4	1.0
$2\frac{1}{2}$	8.0	3.0	2.1	1.0	.5	1.9
3	10.8	3.9	2.5	1.3	.6	2.7
$3\frac{1}{2}$	11.7	4.5	2.8	1.5	.7	3.4
4	12.5	5.2	3.0	1.8	.8	4.1

For example, in a certain industrial plant installation in a building constructed of wood 120 ft. of $1\frac{1}{4}$ -in. conduit will be required and this is divided into 6 runs. The average length of run is $120 \div 6 = 20$ ft. From Table 3 the labor is 22.4 hours per 100 ft. and the total labor is:

120 ft. at 22.4 hours per 100 ft. = 26.88 hours.

In this kind of work it is often necessary to make use of a short piece of conduit or nipple for connecting between an externally operated switch and

a compensator, or for some other short connection. It is evident that these short pieces should not be counted as "runs" in finding the average length of run. The labor on each nipple should be added and will be figured as two terminals, if the nipple is cut on the job; if furnished to the workmen already cut the labor is so small an item that it may be neglected.

The contractor frequently finds it necessary to make up approximate cost figures when the data at hand is so incomplete that it is impossible to make even a reasonably accurate estimate of the material quantities. Under these conditions it is of course impossible to figure the labor accurately and Table 5 may be used to good advantage. When this table is used it is not necessary to figure additional labor on elbows, terminals and bends.

Large Wire

A little consideration of the actual procedure on the job in pulling in the larger sizes of wire makes it plain that it is practically impossible to make up any labor data which will fit all cases. One important item is the labor of moving the reel to the location where the wire is to be fed into the conduit. A 1,500-lb. reel of cable might be moved to position by four men in five minutes, or this work might require several hours. Then a run of conduit of a given length may be all vertical, or all horizontal, or divided in any way between horizontal and vertical lengths. The number of elbows and their location in the run also makes a big difference in the pulling-in labor. Elbow No. 1 has a holding back effect causing a great increase in the friction on the portion of the wire passing around elbow No. 2, similar to keeping tension on a rope which passes around a snubbing post.

About all that can be done in practical estimating is to make use of labor data which will fit certain conditions

assumed as average. We may then expect the total estimated labor on 15 or 20 runs of cable of various sizes to check fairly well with the actual labor.

Table 6 makes it possible to approximate the actual conditions more closely than can be done with a single labor unit—hours per 1,000 ft.—for each size of wire. The total length of wire of a given size is divided by the number of runs of that size to find the average length. A "run" in this case is any feeder or other circuit which is pulled in as one operation. If the feeder passes through several cabinets or pull-boxes it is still considered as one run. Thus if there are in one installation three No. 0 feeders requiring respectively 420 ft., 350 ft., and 180 ft., and one power branch circuit of the same size requiring 120 ft. the total length of wire is 1,070 ft. and there are 4 runs. The average run length is $1,070 \div 4 = 267.5$ ft. This is close to 300 ft., and for this length of run the table gives 24 hours per 1,000 ft. The total labor is therefore $1,070 \times 24 = 25.68$ hours.

It should be particularly noted that the length of a run is considered as the total length of wire in the run, or in finding the average length for several runs the total length of wire of one size is divided by the number of runs.

Table 6 is intended to fit the case of three wires or cables in one conduit. This being by far the most common case, there is much more data available

applying to this arrangement than to any other. For one, two or four conductors per conduit the labor per 1,000 ft. of wire does not differ greatly from that for three conductors per conduit.

TABLE 5—CONDUIT HOURS

Approximate figures for rough estimates. Total labor per 100 feet of pipe, including elbows, terminals and bends.

Size	Conduit Hrs. per 100 ft.
$\frac{1}{2}$ "	6
$\frac{3}{4}$ "	7
1"	10
$1\frac{1}{4}$ "	14
$1\frac{1}{2}$ "	18
2"	26
$2\frac{1}{2}$ "	42
3"	55
$3\frac{1}{2}$ "	65
4"	80

In certain D. C. districts it is common practice to install several conductors in parallel for heavy feeders with each conductor in a separate conduit, as for example for a power feeder consisting of three 1,000,000-c.m. cables in parallel there would be six 2-in. conduits each containing one cable. In using Table 6 this feeder should be considered as one run only, not six runs. If each length of cable is 100 ft. the run length is 600 ft.

Riser Quantities

Complete information on service conductors, service mains, feeders and sub-

feeders is always given in the form of a riser diagram if the job has been laid out by an engineer. If no such diagram is furnished the estimator should make one for himself.

A riser diagram for a large installation appears very complicated at first glance. Some are in fact needlessly complicated. It is the estimator's task to unravel the tangle, and by taking one run at a time this is not difficult.

Conduit and wire are taken off together and a properly ruled form of entering the data is a necessity: Form E2 shown on page 27 is widely used for this purpose.

It is usually best to begin at the left or right of the diagram and take the feeders in order. As a help in checking it is well to assign a number or letter designation to each feeder. The number, point at which the feeder originates and point to which it runs, size of conduit and size and number of wires are first entered on the form. Then the course of the run must be followed through on the building floor plans to find the horizontal distances and number of elbows. It is well to check the location of cabinets which at first appear to be vertically over one another; plans are sometimes misleading in this respect.

A complete riser diagram shows the heights of all floors, so all vertical distances may be computed from the diagram. When a feeder passes through

CONDUIT ON SMALL POWER JOBS

Total labor on conduit run exposed, including bends, elbows, terminals and pipe straps. The total feet of pipe of each size is scaled from the layout and the total number of "runs" of each size are counted, a "run" being any length between two pipe terminals, except a short nipple.

A length from a cabinet to a pull-box, a length from a cabinet to a motor-starter, or a length from a motor-starter to a motor, are each considered as one "run." The average length of run for each size is then found by dividing the total feet of that size by the number of runs of that size, and the corresponding labor unit is selected from the table.

TABLE 3
Exposed Work on Wood

Average Length of Run—Feet	HOURS PER 100 FEET					
	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	2"
10	9	9	23	36	43	57
12	7.3	8	20.4	32	37	50
15	6.3	7	17.3	27	31	42
20	5.4	6	14.6	22.4	26	35
25	4.8	5.6	13	20	23	30
30	4.4	5.2	12	18	21	28
35	4.2	5	11	16.3	19	26
40	4	4.7	10.5	15.3	18	24
45	3.8	4.6	10	14.6	17	23
50	3.7	4.5	9.6	14	16	22

TABLE 4
Exposed Work on Concrete

Average Length of Run—Feet	HOURS PER 100 FEET					
	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	$1\frac{1}{4}$ "	$1\frac{1}{2}$ "	2"
10	11	12	25	38	42	59
12	9.8	10.7	23	34	39	52
15	8.6	9.5	20	29	33	44
20	7.5	8.3	16.7	25	28	37
25	6.7	7.7	15	22	25	32
30	6.4	7.3	13.7	20	23	30
35	6.2	7	13	18.3	21	28
40	6	6.7	12.5	17.3	20	26
45	5.9	6.6	12	16.6	19	25
50	5.8	6.5	11.6	16	18	24

several cabinets the total length first computed should be the total distance from the first cabinet or pull box to the last cabinet. Then a rough estimate should be made of the heights of the cabinets and the total should be deducted from the total distance in order to find the actual conduit length. The Code should be referred to at this time to see whether feeder support boxes are required; the heights of any of these should also be deducted.

The total length of conduit required for the run can now be entered on the form. The length of one wire will be the total distance first found for the pipe, without deductions for cabinet heights, plus an allowance for the length of wire required at each end of the run. Multiplying this length by the number of wires gives the total length of wire which is to be set down on the form. When a number of feeders run from a large pull-box over a switchboard it is often best to determine an average allowance for the length of wire in the pull-box and add this fixed length in the case of every feeder. The number of elbows, terminals and bends should next be counted and entered. As a rule, bends will not be much in evidence in

the original layout except in certain special cases.

Power branch circuits are to be handled in exactly the same way as the feeders, making the entries on the same form. Large conduit for public telephone cables will of course be taken off and entered in the same manner also.

The next step is to total all the quantities which have been entered on Form E2. For this purpose a special summarizing sheet, Form E3, is very convenient. In the blank spaces at the top of the sheet the smallest size of conduit is indicated at the head of the left hand column, and following this the columns are marked

FORM E2

FEEDER SCHEDULE

ESTIMATE NO. 2377
SHEET NO. 5
OF 28 SHEETS
DATE 9-25-27

Job: Hotel Republic - Lighting and Power Feeders
ESTIMATED BY J. G. A.

FEEDER NO.	FROM	TO	CONDUIT				WIRE				L
			SIZE	LENGTH	NO. FEEDERS	WIRE	SIZE	LENGTH			
F21	Subd.	F22	2"	80	3	2	2	33/0	234		
F22	"	F23	2-2"	212	3	2	2	900	252		
F23	"	F24	3"	120	3	2	2	500	275		
F24	"	F25	2-2"	20	2	4	2	1700	112		
F25	"	F26	4-4"	128	9	8	4	950	200		
F26	"	F27	1"	35	2	2	3	4	162		
F27	"	F28	1"	141	2	2	3	4	417		
F28	"	F29	1"	100	2	2	3	4	264		
F29	"	F30	1"	27	2	2	3	4	255		
F30	"	F31	1"	85	2	2	3	4	209		
F31	"	F32	3"	59	2	2	3	4	221		
F32	"	F33	1"	143	2	2	3	4	483		
F33	"	F34	1"	75	2	2	3	4	279		
F34	"	F35	1"	47	2	2	3	4	195		
F35	"	F36	1"	83	2	2	3	4	246		
F36	"	F37	1"	65	2	2	3	4	249		
F37	"	F38	1"	13	1	2	3	4	93		
F38	"	F39	1"	210	5	10	5	4	708	8-#1 to #4	
F39	"	F40	1A to 4A	216	3	24	3	4	279	12-900 to #0	
F40	1A	F41	1"	65	4	2	3	4	171		
F41	Subd.	F42	Dist. 90	5-3"	699	5	35	6	1750	752	
F42	"	F43	2-2"	223	2	12	2	1450	264		
F43	"	F44	2-2"	662	12	28	2	700	722		
F44	"	F45	2-2"	662	12	28	2	800	722		
F45	"	F46	3"	35	4	2	3	4	333		
F46	"	F47	2-2"	228	6	4	2	700	284		
F47	"	F48	1"	105	2	2	3	4	240		
F48	Subd.	F49	2"	136	3	2	3	4	453		
F49	"	F50	2-2"	1002	16	42	3	600	1092		

Feeder Schedule Filled Out to go with Sheets on Opposite Page

TABLE 6—LARGE WIRE—THREE CONDUCTORS PER CONDUIT

Find the average length of wire per run by dividing the total length of one size of wire by the number of runs of that size. Then find in the table the hours labor per 1,000 ft. for this size and length of run and apply this labor unit to the entire quantity of wire of the given size.

For an average length under 50 ft. use the 50 ft. unit; for an average length over 1,000 ft. use the 1,000 ft. unit.

SIZE	HOURS PER 1,000 FEET								
	Average Length of Run—Feet								
	50	75	100	150	200	300	400	600	1000
10	11	10	10	9	8	8	7	7	7
8	13	12	12	11	10	9	9	8	8
6	16	15	14	13	13	12	11	10	10
4	19	18	17	16	15	14	13	13	12
3	21	20	19	17	16	15	15	14	14
2	23	22	21	19	18	17	17	16	16
1	27	25	24	23	22	20	19	18	18
0	30	28	28	26	25	24	22	21	21
00	31	32	35	35	31	27	26	24	23
000	34	36	38	40	36	31	29	27	26
0000	39	41	43	46	41	36	33	31	29
250,000	45	47	50	53	47	40	37	35	32
300,000	49	52	55	60	49	45	42	38	35
350,000	53	57	61	65	57	48	45	41	39
400,000	58	61	65	71	61	52	48	43	41
450,000	61	66	70	77	66	56	51	46	44
500,000	66	71	76	83	71	60	55	50	48
600,000	76	81	88	96	81	70	63	57	55
700,000	85	91	98	106	91	78	71	64	63
750,000	90	96	103	112	96	82	75	69	68
800,000	95	101	108	117	101	86	79	73	72
900,000	105	110	117	126	110	94	87	82	81
1,000,000	115	120	126	135	120	102	95	91	90

for elbows, terminals and bends, then the next column is used for the next larger size of pipe, and so on. The lower part of the sheet or a separate sheet of the same form is used for summarizing wire quantities. In transferring the quantities from one sheet to the other it is best to check with red pencil each item on Form E2 as it is entered on Form E3.

When all items have been entered on the summary sheet and totaled some allowance should usually be added to each total. The amount thus added must be left to the estimator's judgment. If the quantity is small and has been taken off with extreme care a small allowance is reasonable; usually it is best to make an addition which will cover slight errors in the take-off and the unavoidable waste.

After the final quantities have been arrived at on Form E3 all items are transferred to a pricing sheet which should be similar to Form E4. Labor units are taken from the tables and extensions are made and footed to find the total hours of labor.

On the opposite page there are shown complete summary sheets and complete pricing sheets for the lighting and power feeders for a large installation.

Answers to Fundamental Grounding Questions

THERE are many phases of the subject of grounding, the primary, of course, being the manner, the reasons and the legal aspects as affecting the public and other utilities. A series of questions relating to these fundamental points was recently asked of one of the best posted men on the National Electrical Code in both its application and its legal side. Because these very questions are constantly occurring in different localities they are here published with the answers as given by the authority, whose name, unfortunately, must be omitted.

Grounding Devices

1. *Which is the best system by first choice, second choice, etc., for grounding (a) water pipe systems; (b) to driven pipes; (c) to plain flat ground plates; (d) to patent ground devices; (e) to street car tracks; (f) to gas pipes; (g) to a continuous ground wire on pole line construction?*

(a) because multiple grounds are far better than single ones; (f) continuous gas piping gives a thorough ground, but has some disadvantages which are not usually severe; (b), (c) and (d) are about equal, but smaller water piping, not a system, is better; (e) undesirable because it fluctuates, introduces the electrolysis problem or claims and counterclaims; (g) is not the last, but it is not correlative with the other items. A continuous ground wire may be used with any of the above from (a) to (f). If the continuous wire is connected by multiple connections to a water pipe system it is an unsurpassed method.

Ground Connections

2. *Which is the best system by first choice, second choice, etc., for ground connections: (a) at transformer pole; (b) at transformer one pole removed; (c) at service outlet outside building; (d) at service switch; (e) at both transformer and service switch or outlet?*

(d) at service switch and outside it with short inside connection to water pipe, as per National Electrical Code; (c), (a) and (b), with (b) preferred from lineman's viewpoint; (e) is not necessary if (d) is uniformly carried

out. Besides it has some disadvantages from the lineman's standpoint.

Permission to Ground

3. *(a) Should there be any difficulty in obtaining permission from city or municipal authorities to ground to their piping system?*

No, but permission should not be asked or accepted. The ground connection in a standard manner, per National Electrical Code, should be required as a municipal safeguard for the benefit of the public as a whole. No one utility management, whether municipal or private, rightly possesses a right superior to or parallel with that of the whole public, which erects and enforces proper standards. A water works department, private or public, has no right, legal or moral, to assume the prerogative of refusing or permitting connections.

(b) Should any charge or fee be made for such permission?

No fee or charge should be made since no valuable consideration is given, nor is anyone the recipient of such a consideration.

Damages From Grounding

4. *(a) Is there any likelihood of workmen being injured on the water pipe system in removing pipes, meters, etc.?*

There is no likelihood of injury to workmen on water pipes provided:

1. There are multiple grounds,
2. Workmen are informed,
3. They can call up the electrical inspector who can in the very rare case of no multiple grounds authorize a temporary disconnection of ground wire, direct who shall disconnect and who and when reconnect. It is dangerous to have a single ground off even temporarily and very dangerous to leave it off. There is no danger to leave ground on if multiple grounds and little even with but one ground.

(b) Is there any possibility of water pipes being damaged by electrolysis?

No. Any earth current picked up and carried from one multiple ground to another would generally reduce electrolysis rather than increase it.

(c) Does grounding cause any radio disturbance?

Grounding causes no radio trouble. It must be looked for elsewhere. The solid, reliable grounding prevents potential shift and arcing which might cause radio disturbance if grounds were left off or were of the poorer kinds.

Voltage and Current

5. *(a) Should direct-current systems be grounded?*

Yes, if exposed to higher voltages than their own, or if 3-wire.

(b) What is the maximum alternating-current voltage that should be permitted to be grounded?

No limit. No reliance can be placed on freedom from ground, and for higher voltage circuits capacity alone can cause danger of injury even while the circuit is free from ground. A few operators prefer to maintain operation while one or another conductor is temporarily grounded and therefore prefer no permanent ground. Opinion and practice are shifting away from this stand. For safety, where the interior wires are in a grounded metal enclosure or covering, the grounding of a system wire is not so materially advantageous.

Safety

6. *(a) To what extent does a good system of grounding give protection?*

Good grounding affords substantially perfect protection against voltages for which the system is not designed.

(b) Does grounding add any risk to electrical workers?

Electrical workers are protected rather than risked by grounding. For grounded systems he is assured against higher voltages than those for which the system is designed.

(c) Does grounding protect public?
Yes.

Exceptional Conditions

7. *In a dry climate, gravelly soil, large quantities of solid rock formation, would any ground other than on a water pipe system be considered as giving good protection?*

No. But a little of a good thing is better than none.

Remodeling to Replace New House Construction

Efforts of Building Trades in This Direction Offers New and Large Market to Electrical Contractors for Adequate Wiring and Lighting Equipment

IN THE past electrical contractors who specialized in housewiring found their market in unwired homes and in new construction. The former has dwindled until it no longer occupies a large place as a market factor. Until quite recently the new house has afforded enough work to keep the men busy. During 1927 the construction of new houses became very slow with every indication of a continued dull period for some time.

While the house building boom was going it was tremendous and to take care of it a large force of contractors, of building mechanics, of supplies was developed and a large economic investment made. All of these people are now facing a period of severe depression unless something can be found to replace the new house market.

It is believed that the substitute has been found in the old house of good construction which needs remodeling to bring it up to 1927 standards of living. Many of the building interests have placed themselves behind the movement and an effort is being made to have a national campaign fostered by all the building trades and suppliers for the remodeling of old homes.

The trend towards modernizing of our homes immediately suggests another market for wiring and lighting equipment. These old homes are without convenience outlets. The switches are of the rotary type that probably extend out an inch or so from the wall. The service is probably in an old box with cartridge fuses and a knife switch that sputters like fireworks when opened. The lighting is likely to be combination gas and electric and very little at that.

The remodeling of such a home offers the electrical contractor an opportunity to really do a modern job of wiring and lighting. The plumber will see to it that his work is all of the latest style. The painter and paper hanger will have only the best and latest. The carpenter will lay fine hardwood floors, etc., etc.

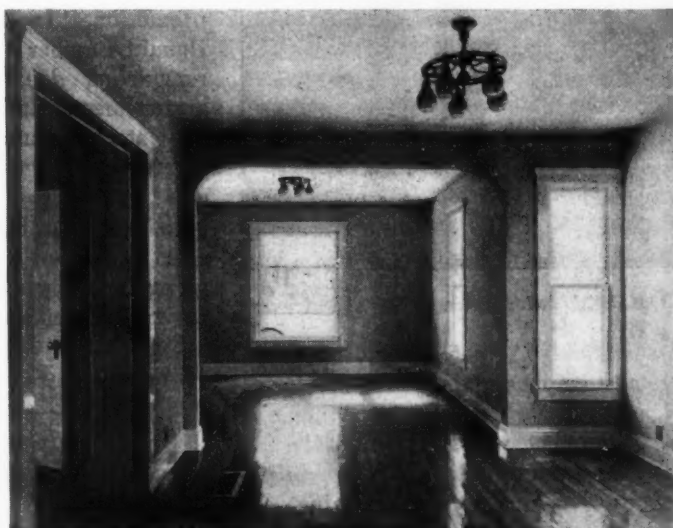
The electrical wiring and lighting must compare with the work of others. These jobs will call for the best of workmanship and layout.

Experimental Home

A recent example of what can be done in the rehabilitation of an old house, increasing the investment of the house owner, and giving good business to all the building trades,

was the experimental model home at Dixon, Illinois, which was modernized by The Household Magazine. The illustrations show before and after views of the house which was a typical sub-standard frame house in a typical small city. Mr. George E. Piper of Household Magazine believes that a large percent of the houses of the country are in this class—some in better shape than the Dixon house, of course; and a great many in even worse condition. "The market provided by this large group of sub-standard or Class B houses," he says, "can be the source of a large share of the business of the building trades during the next few years."

"A substantial proportion of new houses are acquired by previous home owners," Mr. Piper believes, "and this type of construction is slowing down because of the trade-in problems involved by the old home. The old home must be liquidated before the new home can be financed. This unthought-of factor, the 'used' home, is becoming quite a problem which some responsible persons believe may, in the near future, become as much of a problem as the used automobile has been for some



How the Living Room of the Experimental Home on the Left Has Been Modernized to the Room on the Right

time in the transportation field.

"The National Federation of Women's Clubs has recently concluded a survey covering all sizes of towns in all states. They have found that there are millions of families who do not even have running water in the house and many more who do not have modern stationary bathtubs, indoor toilets, kitchen sinks and laundry equipment. Millions of homes are inadequate and unsatisfactory in exterior appearance, interior comforts, and attractiveness." The remedy, he states, is rehabilitation.

The United States League of Building and Loan Associations Commission on Better Relations favors the program and its members will aid in the financing of modernization. At their annual meeting in Asheville, N. C., in July, they approved this report: "The National Home Rehabilitation Movement should include as an integral part of its program the popularizing of the idea that extensive remodeling can be financed easily through the Building and Loan



The 1927 Interpretation of a Stairway

Association. As a financial institution we must emphasize the economic aspects of home rehabilitation: 1. A home is an investment which must not be allowed to deteriorate. 2. Rehabilitation means greater resale value. 3. Rehabilitation is a form of insurance which the householder should carry to protect his family in the event of his



The Stairway Before Being Remodeled

death and a consequent forced sale of the property. Assured of building and loan associations financing for their customers, dealers in electrical fixtures, furnaces, and the like, should make the Home Rehabilitation Movement a means of increasing greatly their business at little additional expense."

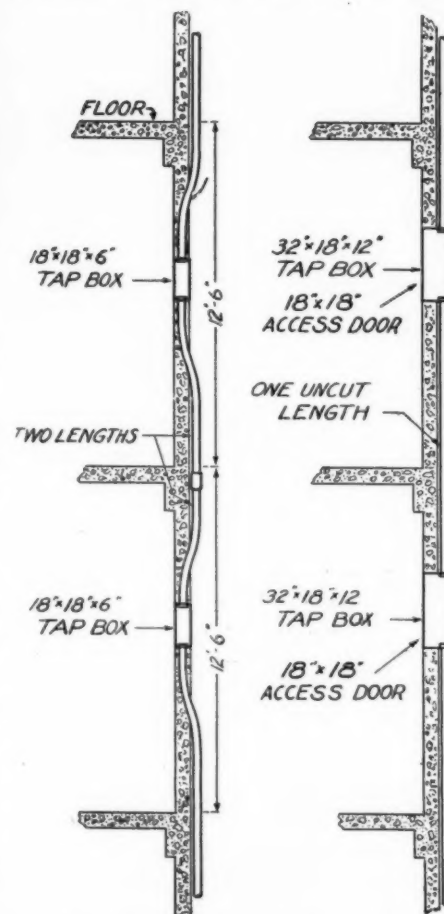
What actually can be done in a typical city is shown by the campaign in Decatur, Illinois, which, in a short time, greatly increased the sale of electrical materials and other building supplies. This was a cooperative local campaign for modernizing old houses and was accomplished by advertising and general promotion. In Minneapolis the McDonald Lumber Company organized a remodeling department with working arrangements with electrical contractors, carpenters, plumbers, painters and others and all get a share of the business.

In several other localities the program has been started; when it gets going in a big national way more rewiring and refixturing business will be available for the aggressive electrical contractor.

Simplified Riser in Loft Building

In a concrete loft building it was intended to provide a general-purpose power riser as shown in the section of

the building on the left side of the sketch. Boxes were to be provided on every floor for giving access to the riser so that taps could be made. The distance from floor to floor was 12 ft. 6 in. and it was specified that junction boxes 18 in. by 18 in. by 6 in. be used. This made the length of conduit between boxes 11 ft. 3 in., allowing for offsets and bushings. As this is a little more than one length of pipe it was thought advisable to lengthen and deepen the box sufficiently to permit the use of a straight uncut length of conduit, as is shown on the right hand of the sketch. It was found that the extra cost of the



Right Hand Method Less Expensive than That on Left

larger box was less than the cost of bending, cutting and threading.

This scheme would prove practical for story heights varying between 11 ft. 6 in. and 13 ft. by simply changing the size of the box. The change in this case saved the electrical contractor the necessity of temporary shores for supporting his work prior to building the partitions, saved the general contractor the necessity of cutting around the conduit offsets, and provided an access door of ample size.

Unfair Specifications

The Use of Some Clauses by Architects Are Productive of Much Misunderstanding

By L. E. MAYER

Chairman, Architects and Engineers Committee, Association of Electragists, International

AS science has developed many new additions to the modern railroad, the automobile and airplane, to facilitate our mode of travel, so has the architect developed the ability to write specifications in such a manner that the engineering requirements of the electrical contractor have been materially reduced. However, in this later advancement there has arisen a condition, by the use of certain clauses in the specifications, that is unfair, impractical and expensive to the electrical contractor, as it has developed the unknown quantity. As soon as clauses of this nature develop in a specification we transpose ourselves from estimators to approximators. As contractors we know that approximating has little in common with a scientific basis in estimating.

The Architects and Engineers Committee of the Association of Electragists submitted to the A. E. I. Executive Committee at the St. Louis convention certain paragraphs pertaining to specifications which qualify these statements and was instructed by the Executive Committee to publish such clauses for the purpose of apprising the membership of their wording and intent, and to recommend wherever they exist that the contractor take exception to such clauses in submitting estimates rather than attempting to approximate their value.

Following are clauses which are typical examples of several specifications which have but lately been submitted to contractors for bids:

"TEMPORARY LIGHT WIRING: This contractor shall furnish and install temporary drop cords throughout this space to meet the requirements of the Inspection Bureau, furnish wire, lamps, sockets and shall maintain these lights until the permanent lighting system is placed in operation, furnishing all material and labor as may be necessary to maintain these lights during this period."

"Contractor shall furnish and maintain the temporary drop cords, furnishing 100 watt lamps for all outlets and 10 additional lamps to replace those broken."



L. E. Mayer

"This contractor shall furnish and install all necessary temporary light required during construction and for architect's office as directed by the superintendent. He shall also bring power service to a central point in building for the use of mason contractors."

It was the opinion of several electrical contractors, to whose attention these clauses were brought, that the "temporary light" was required for the architect's office, overlooking the fact that it specifically states that the temporary lighting is required during construction and for architect's office, which was ultimately determined to mean for lighting the entire building under construction.

The sentence in reference to bringing service to a central point in the building does not indicate the capacity of lift required by the mason contractor and on that account one is unable to determine the capacity of the motors required.

Another form of specification that should be given considerable thought is a paragraph stating that the contractor shall receive all motors from the sub-

contractor at the entrance of the building and from this point receive, set and connect them in the locations as indicated on the plans. The paragraph as given indicates the size of motors but no information is conveyed as to the type of motors, high or low speed, and in many cases for certain places a 5-h. p. motor is specified, but when it arrives at the building it is slow speed and would be equivalent in weight and size to a 25 or 30-h. p. machine.

A new type of specification is now being included by architects on office buildings and similar structures wherein it is stated that the electrical contractor shall figure so many thousand feet of conduit or such other material as the building may need, prices to be submitted on a unit foot basis, the total quantity being specified both for wire and other material, same to be installed as the space for tenants may require. This form of specification has allowed a job to be open several months after the building is completed. In some cases a demand is made for a credit on account of the excess quantities which ultimately proves a loss to the contractor.

With the assistance all electrical contractors in refusing to submit prices on conditions as recited above, this committee will be in a position to take the matters up before architects and engineers for the purpose of having them eventually eliminated from specifications.

New Booklet on Paying by Check

Electrical contractors who view with alarm the growing total of payroll thefts, frequently accompanied by loss of life, and who are considering the possibility of paying their help by check, will be interested to learn that the Chamber of Commerce of the United States has made an investigation of the subject and issued a free booklet entitled "Payment of Wages by Check."

Latest Development in

Trough Wiring

DURING the past few years a new type of wiring has come into existence. The process of evolution has been so gradual that it has escaped attention until suddenly the idea was taken up and developed further by a manufacturer, and now we realize that a new member has been added to the family of wiring types—trough wiring. Not a full-fledged, grown-up member of the family as yet, because the newcomer has not yet been initiated into the mysteries of the Code, but an actuality to be reckoned with just the same.

Trough wiring did not spring full panoplied for war from the fertile brain of some manufacturer, but was gradually developed by the contractor to meet an actual need. The pull-box came early in the history of conduit wiring, also the cabinet with a wiring compartment or gutter. What more natural than that the pull-box should be elongated and attenuated to become a gutter apart from a cabinet?

The final step was to design a standard trough section and the necessary fittings so that the materials might become a commercial product, forming a type of wiring sufficiently flexible to meet the requirements of practical use. This has been done by the Square D Company, the result being a product which they have named Square-Duct.

The trough developed by this manufacturer is shown in Fig. 1. It is made of No. 16 gauge steel in two standard lengths, 5 ft. long and 2 ft. long. The

width is 4 in. and the height is 3 in. A flanged cover is hinged to the trough and is provided with spring latches to hold it in a closed position. A flange is spot-welded to each end of the trough sections, and the sections are joined by bolting the flanges together. Concentric knockouts for $\frac{1}{2}$ in. to $1\frac{1}{4}$ in. conduit are provided on 3 in. centers in the sides and bottom.

Fig. 2 is a simple but cleverly designed fitting which serves a variety of uses. The top and bottom of this fitting are closed; the sides and ends are open and may be fitted with cover plates, thus it may be used as a 90 deg. elbow, a T, a cross or a plain extension piece. The length is $5\frac{3}{8}$ in. The telescope fitting, Fig. 3, provides an adjustment of $5\frac{1}{2}$ in. in length. By means of the proper combination of 5 ft. and 2 ft. trough sections, junction boxes and telescope fittings, practically any length of duct can be made up.

The T fittings, Fig. 6, may be attached to a trough section at any point by cutting out a piece of the side 4 in. long. Figs. 9 and 10 are hangers to be bolted between the end flanges of two sections when the duct is to be supported from the ceiling, and the bracket hangers, Figs. 11 and 12, are inserted in a similar manner for supporting the duct on a wall. If necessary to cut a section of the trough, the collar, Fig. 8, may be bolted to the end of the trough by drilling four holes. The duct may be connected to a cabinet by cutting a 3 in. by 4 in. hole in the cabinet and

using a special collar designed for this purpose, not shown here.

Fig. 13 illustrates very clearly the use of several of the fittings. Figs. 14 and 15 show how the job looks when it is done. It is stated by the manufacturers that some 40,000 ft. of Square-Duct have been installed up to the present time. The widest field for the application of this material will be found in power wiring in industrial plants, where the duct may be used as a trunk line carrying either a number of branch circuits or one or more bus feeders tapped to feed large motors, with conduit leading from the duct to each motor. The chief advantage of such a wiring system is of course the ease with which it can be adapted to changes in the sizes and location of the motors such as frequently occur.

Estimating Data

The present prices of the material f. o. b. factory are approximately as follows: 5 ft. duct section—\$2.25; junction box (Fig. 2) and telescope fitting (Fig. 3)—\$1.00 each; T fitting—75c; hangers—15c.

No data is available as to the cost of labor for installing the duct or installing the wire in the duct.

The development of trough wiring as a distinct wiring type raises some very interesting questions. The size of cross-section selected, 3 in. by 4 in., would seem to be just about right. Sufficient space is provided and any smaller size would no doubt cost nearly the same.

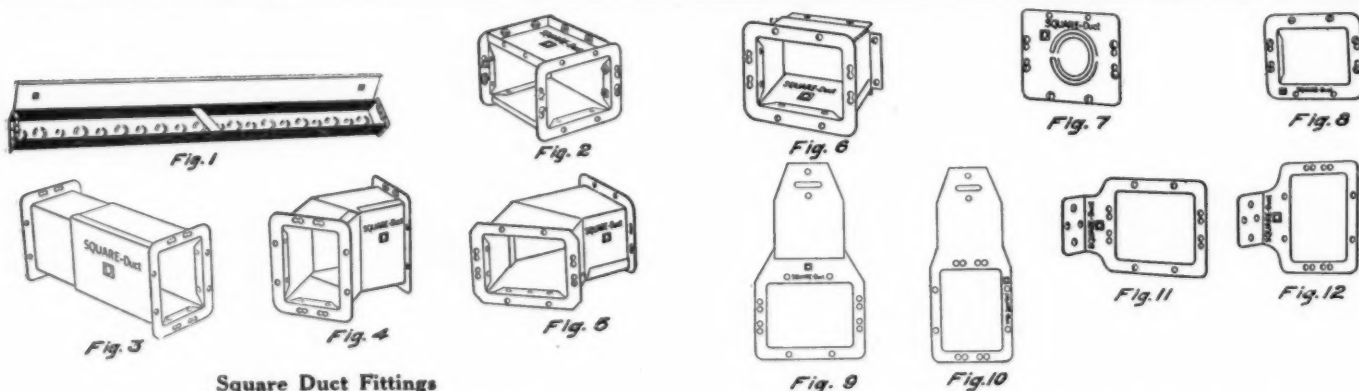
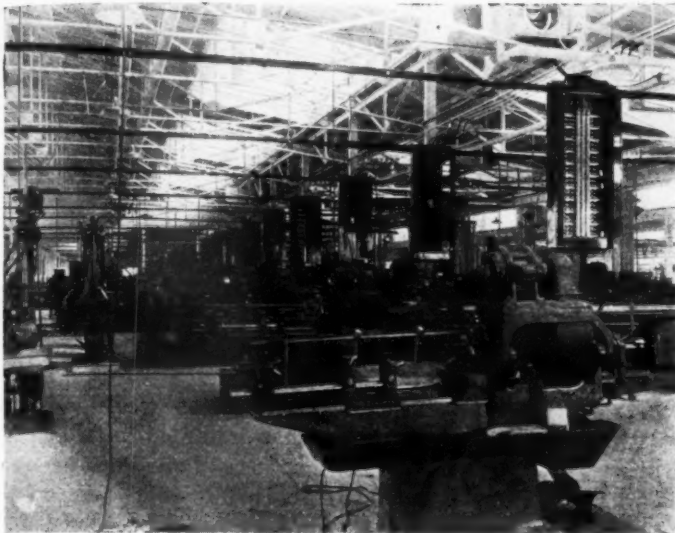


Fig. 1—Wiring Trough
Fig. 2—Junction Box
Fig. 3—Telescope Fitting

Fig. 4—45° Vertical Elbow
Fig. 5—45° Horizontal Elbow
Fig. 6—T Fitting

Fig. 7—End Closing Plate
Fig. 8—Trough Collar
Fig. 9—Horizontal Drop Hanger

Fig. 10—Vertical Drop Hanger
Fig. 11—Horizontal Bracket Hanger
Fig. 12—Vertical Bracket Hanger



Figs. 14 and 15—How the Job Looks When Completed

The cross-sectional area enclosed by the trough is nearly the same as that of 4-in. conduit the wall thickness of which is 0.237 in. as against 0.0625 in. for No. 16 gauge steel. Conduit on the other hand has this wall thickness: First, because pipe was standardized before it was used as conduit and it is cheaper

three 1,000,000 c.m. cables and may not contain more than nine wires of any size. The reasons for this rule are that a large number of wires in one conduit have a tendency to bind in passing around elbows so that the insulation may be injured and that trouble in one circuit should be localized so that it will not be communicated to more than two or three other circuits. As troughs are being commonly used today there is no limit to the size and number of wires placed in one trough except the limit dictated by convenience in handling. Any rigid restrictions such as are fixed in the case of conduit would seriously limit the usefulness of the trough.

To draw up specifications for the construction and use of the trough will be no easy task, but undoubtedly rules will be made which will specify the thickness of the metal and the number of wires of any given size which the trough may contain.

new publication is much too large to be a handbook.

Contractors who handle line construction will find in this book a large amount of information which cannot readily be obtained elsewhere. Of first interest to the contractor are the sections on Methods of Construction and Specifications for Materials. A large number of diagrams of transformer connections are shown and the capacities of transformers when banked in various arrangements is fully covered. The section on Electrical Calculations is a complete textbook on A. C. theory as applied to transmission and distribution and includes charts and tables for the practical calculation of voltage drop, etc. The calculation of sags and tensions in wire spans is very comprehensively treated and all data required is given.

The book is very attractively bound in flexible leather, with gold edges, is exceptionally well printed on good paper and will be a valuable addition to the library of any contractor or engineer who has any special interest in this branch of electrical construction work.

Code Interpretation No. 12

A finding has been reached on National Electrical Code interpretation item No. 1 (1-A and 1-B) and released as follows:

Question: Does paragraph (b) of Section 5,003 permit the installation, without additional shields or casings, of apparatus having housings completely enclosing all live parts?

Answer: Yes.

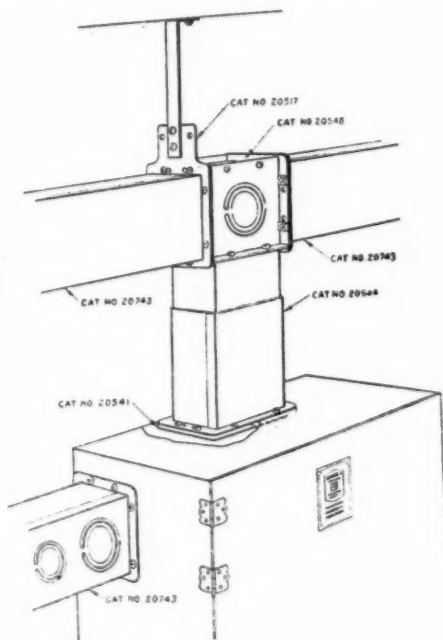


Fig. 13—Use of Fittings

to use a standard material than to manufacture special pipe for use only as conduit; second, if the wall thickness were appreciably reduced it would be much more difficult to bend the pipe; third, the heavier the wall of the conduit the greater is its resistance to burning through in case of severe arcing inside the conduit.

Again, a 4-in. conduit may contain

BOOK REVIEW

Overhead Systems Reference Book.

Prepared by a special committee of the Overhead Systems Committee, Engineering National Section, National Electric Light Association. Published by the N. E. L. A., New York City.

In 1914 the N. E. L. A. published a Handbook on Overhead Line Construction, which up to this time has been the standard reference book on this subject. The Overhead Systems Reference Book is a revision of this Handbook with so much additional matter that the

Mechanical Installation of Motors and Control--II

How to Mount Motors on Walls and Ceilings Under Varied Conditions Together With Information on Gear Alignment

THE commonest method of wall mounting is illustrated in Fig. 12. With this arrangement, the movement of the sliding base is in a vertical direction, especially adaptable to ver-

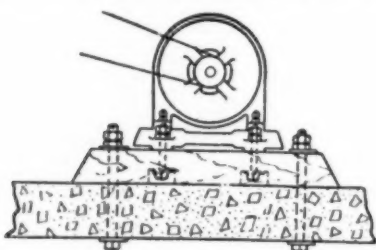


Fig. 12—Mounting Motor on Brick or Concrete Wall

tical or nearly vertical belt drives. This mounting can be used on stone, brick or concrete walls.

Fig. 13 shows a method of wall mounting on the studding of a frame building. If it is suspected that two adjacent wall studs are not sufficiently heavy to safely support the motor, the weight may be distributed by having the stringers extend over more than two studs. Heads of bolts on the out-

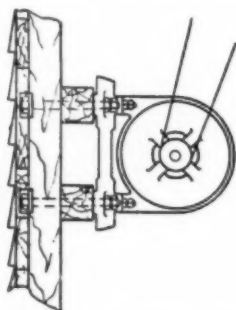


Fig. 13—Method of Mounting Motor on Wooden Wall

side of the wall can be recessed into the boarding and shingled or clap-boarded over. Lag screws should be used only where absolutely necessary.

Fig. 14 shows a typical wall bracket—a necessary arrangement in cases where the belt is to run parallel to the supporting wall. The bracket is at-

tached to the wall in the same way as the supports in Fig. 21. The joint between the vertical and horizontal members is mortised and pinned.

Fig. 18 illustrates a practical and economical support for mounting a motor. This support can be made from two cast-iron wall brackets commonly used to support pillow blocks for carrying line shafting along a wall. The

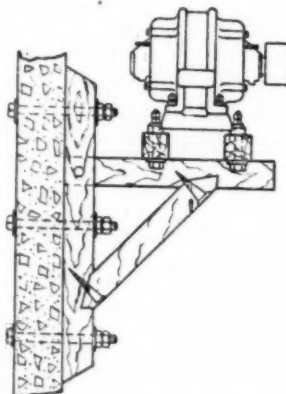


Fig. 14—Wooden Bracket Mounting on Concrete or Brick Wall

brackets can be secured from any manufacturer or jobber of power-transmission material.

This support can be used for any motor having a one-piece sliding base. The standard 1½-in. brackets are suitable for carrying a motor of any size up to 1½-h. p. rating. The mounting of a larger motor would depend en-

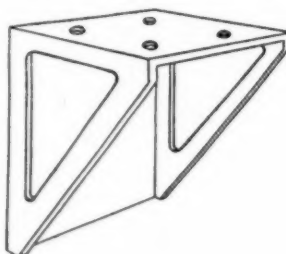


Fig. 15—Bracket Made of Cast Iron or Steel

tirely on the ability of the wall, or structure to which the brackets are attached, to carry the load.

One of the advantages of this sup-

port is, that after full adjustment has been secured on the belt-tightening screw, it can be returned to its original position, the base bolts loosened and the motor moved back to take up the belt slack. This can be repeated until the stretch is all out of the belt.

Fig. 15 illustrates a wall bracket made from cast iron. It can be made in a

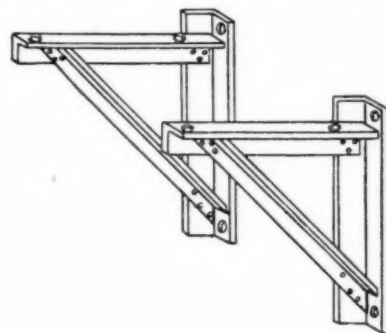


Fig. 16—Wall Bracket of Structural Iron

variety of sizes and shapes to conform to the particular needs of any installation. Brackets of this general construction are quite often used on machines to support motors for individual drive. Dependent upon the size and strength of the bracket, motors of 15 or 20 h.p. may be supported.

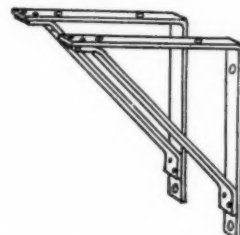


Fig. 17—Motor Bracket Made from Strap Iron

Fig. 16 illustrates a wall support made from angle iron or structural steel. Rivets, bolts, or arc welding may be used to assemble the parts. A safe rule to follow when selecting the size of angle iron is to use material as wide as, or wider than, the motor foot.

As a guide in the selection of the proper size angle iron, Table IV gives

* From the Motor Dealer's Power Manual, General Electric Co.

sizes of motors with the corresponding sizes of angles.

The mounting of large motors would depend entirely on the ability of the wall or structure to which the brackets are attached, to carry the load.

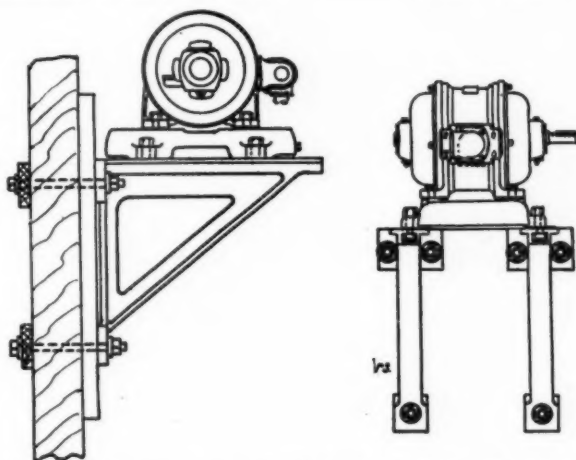


Fig. 18—Motor Bracket Made from Line Shafting Hangers

Fig. 17 illustrates another form of bracket that can be made from strap iron. It would be unwise to mount motors above 5 h.p. on this type of bracket, because the larger strap iron necessary for strength becomes harder

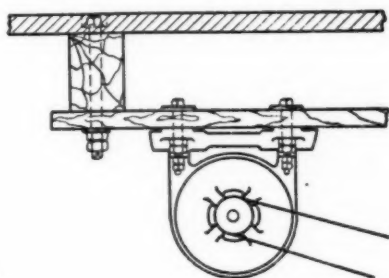


Fig. 19—Supporting Motor from Wooden Ceiling Joists

to work up into the various shapes. The size of strap iron for a 5 h.p. motor should be 3 by $\frac{5}{8}$ -in. A general rule to follow in choosing the proper size iron is to have it as wide as and equal to the

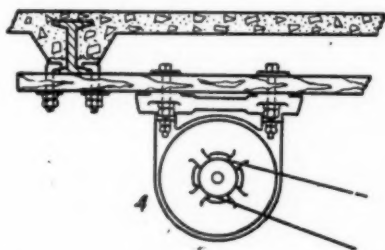


Fig. 20—Supporting Motor from Steel I-beam

thickness of the motor foot. Belts, rivets, or arc welding may be used to

assemble the parts of the bracket.

Fig. 19 shows what is probably the commonest and generally the best method of installing motors intended to drive overhead shafting in a wooden frame building. The principal advan-

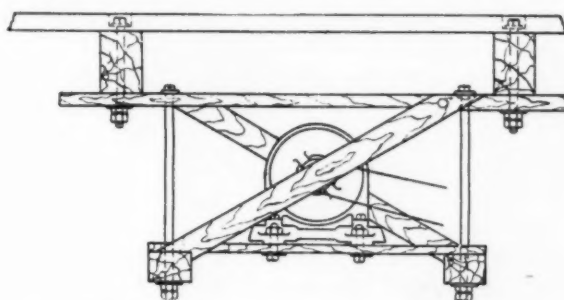


Fig. 21—Supporting Motor from Ceiling Joists with Motor in Horizontal Position

tages in ceiling installations are saving in both floor and wall space, and in securing an essentially

horizontal direction of belt drive. Two stringers are used extending between floor joists (in case of light motors with small base area a solid plank will be

TABLE IV—SIZE OF ANGLE IRON FOR DIFFERENT HORSE POWER RATINGS

H. P.	Size Angle in In.			
25	5	by	5	by $\frac{3}{4}$
20	4	by	4	by $\frac{3}{4}$
15	3½	by	3½	by $\frac{5}{8}$
10	3½	by	3½	by $\frac{1}{2}$
5	3	by	3	by $\frac{1}{4}$

NOTE.—For a given h.p. rating, high-speed motors are generally built in smaller frame sizes than slow-speed motors. The next smaller angle can be used for high-speed motors.

equally serviceable and more convenient to install). The flooring above can be recessed as shown, so that the heads of supporting bolts need not project. If the belt angle with the horizontal exceeds 45 degrees the sliding base will

become comparatively effective and a mounting similar to Fig. 13 would be preferable.

Fig. 20 is analogous to Fig. 19 except that the building is assumed to be of steel frame construction. If the steel floor beams are encased in concrete, no trouble will be caused by chipping away as much as is necessary to permit application of hooks or clamps as shown. The hooks illustrated can be bent up from 1 or 1½-in. round steel, upset at the bend for greater stiffness. Several types of clamps are especially made for this kind of work and should be used when available.

Fig. 21 shows a method of ceiling-suspended, platform mounting. Two stringers are first attached to the floor beams or joists, exactly as in Fig. 19 or 20, and from these the platform is

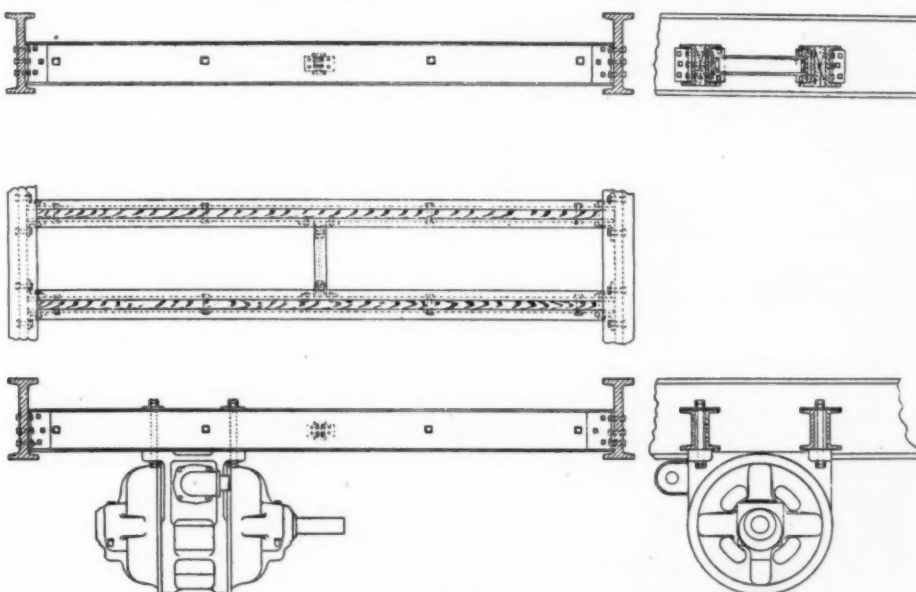


Fig. 22—Mounting Motor on Ceiling Using Structural Steel

hung by four $\frac{1}{2}$ - to 1-in steel rods. The platform should be braced to prevent swaying or vibration and in direction against belt pull, as illustrated. This method of mounting will seldom be appropriate except for direct-connected fans, compressors, pumps, or dynamos, or where for some particular reason it is not desired to run an inverted motor.

Fig. 22 illustrates an excellent method to use when a motor is to be mounted on the ceiling where the building is constructed of structural steel. Two channel beams, placed back to back, form one stringer. The wood between the channels acts as a spacer for the holding-down bolts of the motor. The ends of each channel are bolted to the cross stringer. If the stringers are

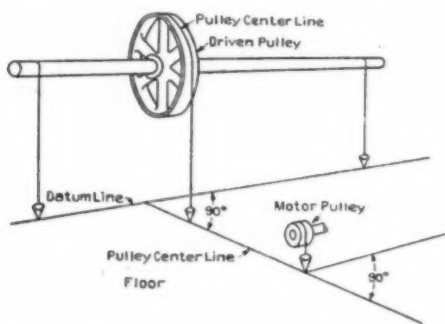


Fig. 22—Method of Aligning Two Pulleys

I-beams, as is usually the case in up-to-date mill construction, the ends of the channel beams can be supported by the flanges on the stringers. There are also on the market several kinds of patented clamps that can be used to fasten cross members together. These clamps eliminate the drilling of the beams.

Aligning Motors

Assuming now that the motor is properly located and the right kind of mounting has been built, the next step is to properly align the motor with its drive.

The tools usually used for aligning motors or line shafting are the square, plumb-bob and level. Tool manufacturers also build combination squares and levels and similar tools that are a material aid in quickly and accurately aligning machinery.

The first step to be taken when aligning two machines is to see if they are level. It is possible for a machine to be out of line in more than one plane. If by placing a level or plumb on the machine, it is found to be out a certain amount then the motor must be mounted so that it will also be out a like amount.

Belt drive is the most common form of mechanical transmission but the principles involved and the methods used apply, in general, equally well for chain drive.

Fig. 23 illustrates a simple and easy method of aligning a motor pulley with the driven pulley. First the crown or center line of the pulleys must be on the same center line, and second, the motor shaft must be parallel to the driven shaft.

By using a plumb-bob and drawing a datum line on the floor, you have

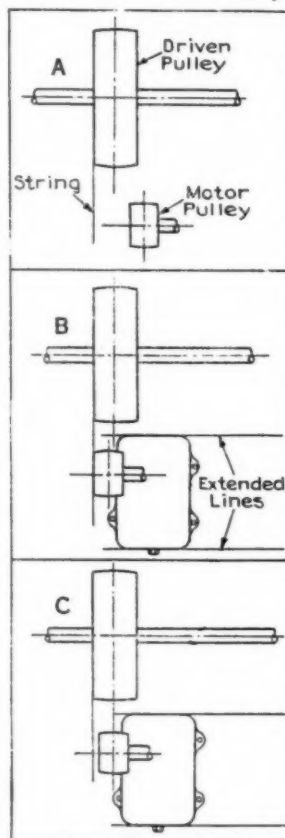


Fig. 23—Method of Checking Alignment

something to work from. Next, drop a plumb line from the center of the driven pulley to the floor. With a square, draw a line perpendicular to the datum line. Next, drop a plumb line from the center of the motor pulley and move the motor up or back until the plumb-bob rests on the center line of the driven pulley. From the pulley center line, perpendiculars may be drawn through the centers of the holes in the motor feet. A level should be used to see that the line shafting is level. If it is not, then the motor feet must be shimmed up so that the motor shaft and the line shaft will be "out of level" the same amount. Chain drive may be aligned in a similar manner.

With belt drive, a sliding base is

nearly always used to allow for belt adjustment. Another method, therefore, is to use the following procedure when aligning two pulleys (Fig. 24.)

1. Place the motor on the base so that there will be an equal amount of adjustment in either direction and firmly fasten the motor to the base by means of the holding-down bolts.

2. Mount the motor pulley on the motor shaft.

3. Locate the base and motor in approximately the final position as determined by the length of belt.

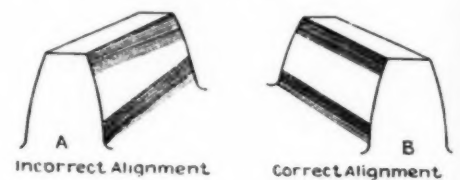


Fig. 24—Method of Aligning Gears by Using White Lead

4. Stretch a string from the face of the driven pulley toward the face of the motor pulley. See illustration (A).

5. Parallel the face of the motor pulley with this string. See illustration (B).

6. Using a scratch pin, mark the end positions of the sliding base. See illustration (B).

7. Extend these lines as illustrated below in (B).

8. Move the base and motor away from the string an amount equal to one-half the difference in face width of the two pulleys. Use the two extended lines as a guide to keep the base in its proper position. See illustration (3).

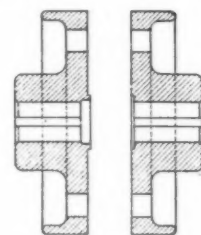


Fig. 25—Solid Flange Coupling

9. The belt should now be placed on the pulleys to see if it operates satisfactorily. If it does not operate properly, the base may be shifted slightly until proper operation is obtained.

10. Finally, firmly fasten the base to the floor, ceiling, or side walls by means of lag screws or bolts.

It is important with gear drive to have the gear and pinion mesh properly and to have the two shafts parallel in both vertical and horizontal planes.

Geared machines must be accurately aligned and rigidly fastened to a common base. When gears are properly meshed, it should be possible to pull a thin piece of paper from between the teeth without tearing. To prevent accidents, gears and chains should be protected by metallic guards or shields wherever necessary.

An easy and fairly accurate method of checking alignment of gears is illustrated in Fig. 25. Coat both surfaces of the gear teeth with a thin layer of white lead. Next, rotate the motor shaft slowly by hand and after the coated section has passed over the pinion, an impression will be obtained that will look similar to either sketch A or B. The shaded portion of both sketches represents the white lead, the white portion being the surface where the lead has been rubbed off due to the sliding action of the two gears. If the alignment is not right, an impression like A will be the result, showing that the shafts are not parallel and therefore the gears bear more heavily on one side than on the other. After a few trials and slight movement of the motor, a fairly straight, uniform line across the entire face of a tooth will be the result. It may be necessary, in some cases, to use shims under the motor feet in order to obtain correct alignment.

When lining up fabroil pinions, be sure that the gear does not run on the metallic shrouds of the pinion due to the end play of the rotor. In other words, the pinion should be so spaced that at both extreme positions of end play the gear will not run on the metal shrouds of the fabroil pinion.

Direct Connection

Direct-connected machines must be mounted on, and rigidly fastened to, a common base and it is essential that the machines be accurately aligned. It is just as essential that the two shafts be accurately aligned where so-called flexible couplings are used, otherwise, trouble from end thrust may be encountered.

G-E solid flange couplings have all surfaces machined, bolt holes reamed, and the two adjacent surfaces are provided with a male and female fit to insure their alignment. Fig. 26 illustrates the manner in which these couplings would fit together.

To make sure that the two shafts are parallel, a thickness gauge should be

used between the faces of the two halves. The thickness should be checked at four equally spaced distances around the outer surfaces of the flanges. When the faces are parallel, the two shafts are parallel.

If the two halves of the coupling are not the same diameter, using a straight-edge and a thickness gauge on the cylindrical surfaces of the two halves,

will show if the shafts fall on the same straight line.

A method often used where the dead rise of the two machines is different and there is no male or female section of the coupling, is to place a steel ball between the lathe centers of the two shafts. The ball will maintain correct centers while a straight-edge is used to check the alignment.

Effect of Red Seal Work on Uncertified Homes

A SURVEY of around 500 homes in California taken at random dis-

TABLE I—RECAPITULATION
of Survey of
California Residential Electrical Installations

		*CLASS 1 HOMES	*CLASS 2 HOMES	*CLASS 3 HOMES
Light Outlets	Ceiling	12.7	21.6	16.3
	Bracket	1.7	11.8	16.5
Switch Outlets	S.-P.	11.0	14.6	14.7
	3-Way	2.1	3.9	6.0
	4-Way			0.2
Conv. Outlets	Single	8.4	17.7	16.0
	Double		2.6	2.7
Circuits	Radio	0.3	0.9	1.4
	Light.	2.2	4.1	5.0
Air Heaters	Conv.-Out.	1.0	2.9	3.5
	Wall		0.5	1.35
	Portable		0.04	0.43
	% of Homes Wired for heat		49 %	46 %

The above figures represent the average number of each item installed in each home surveyed.

Ranges	Full Service	0.9%	3.1%	100 %
	Part Service		85.8%	
Water Heaters	No Service	99.1%	11.1%	
		0	1.0%	43.3%

The above figures represent the percentage of homes equipped with the specified services as compared with the total number of homes surveyed.

ELEMENTS IN MAIN SERVICE

Conduit	1/2"	2.6%		
	3/4"	95.6%	10.2%	
	1"	0.9%	0.3%	62.1%
	1 1/4"	0.9%	3.0%	24.3%
	1 1/2"		86.2%	13.6%
Wire	2		0.3%	
	2-10s	87.8%		
	2- 8s	2.6%		
	3-12s	0.9%		
	3-10s	7.8%	95.7%	
	3- 8s		1.3%	
	3- 6s		1.8%	
	3- 4s	0.9%	0.6%	54.1%
	3- 2s		0.6%	35.1%
	3- 0s			2.7%
Switch	3-00s			2.7%
	3-000s			5.4%
	30A	96.5%	96.7%	
	60A	3.5%	0.9%	27.0%
	100A		2.1%	54.0%
	200-A		0.3%	16.3%
	300-A			2.7%

The above figures represent the percentage of homes equipped with the specified sizes of service as compared with the total number of homes surveyed.

*Class No. 1 Homes are those upon which no RED SEAL effort was made. Class No. 2 Homes are those upon which unsuccessful RED SEAL effort was made. Class No. 3 Homes are those upon which successful RED SEAL effort was made.

closed what so many people have felt to be the case, namely, that the effect of Red Seal work did not stop with actual Red Seal installations, but helped to bring a great many other installations nearer to adequacy.

The survey was taken of an equal number of recently built homes of three classes: Those upon which no effort had been made to sell Red Seal; those upon which an unsuccessful effort had been made and finally houses that were wired according to the Red Seal Plan.

The results of this survey have been compiled and a tabulation as shown here makes it apparent that where Red Seal selling has been brought to bear on a house builder the results are worth while.

In light outlets the Red Seal and the unsuccessfully solicited Red Seal homes are about on a par. There is little difference in switch outlets, while the Red Seal homes had to take second place so far as convenience outlets were concerned.

The Red Seal houses used large wire and entrance switches which will permit them to be added to with more safety as more electrical conveniences are desired.

Then compare these two classes of homes with the homes that were not solicited for Red Seal wiring—almost double the light outlets, 50 percent more switch outlets, more than twice as many convenience outlets, more than twice as many circuits.

According to Victor W. Hartley, executive secretary of the California Electrical Bureau, it was generally the partial installation of a range service or some minor omission, such as not placing lights and convenience outlets on separate circuits, that caused a great many of the unsuccessfully solicited to be deprived of the Red Seal.

Payroll Handling on Near and Distant Work

New Jersey Electragist Uses Different Systems on Jobs That Are Far Away From Office From Those Employed on Work at Home

THE John R. Proctor Company, electrical contracting firm of Bayonne, N. J., utilizes a different system of handling the payroll on jobs located near at hand than they do when the work is somewhat distant. On local work a daily time card is used, and this is turned in at the office by the fore-

man a workman receives his money he signs his name on the face of the envelope, thus receipting for his wages. These envelopes, when they have been completely filled on the face, are filed away for a permanent record.

The time card on local work is laid out for a description of the work the

a glance just what the man has done in a given time. For example, E-1-A means laying one-inch conduit. A figure is then placed after this to show quantity. Thus E-1-A-30 would mean laying 30 ft. of this size of pipe. By referring to the time taken for this operation Mr. Proctor can determine the efficiency of the man and whether or not he is keeping up to the estimated labor for the job.

On out of town work the daily time card is not used. Instead, the job foreman records each man's time on a weekly time sheet. This shows the amount due each man, and it is then entered on the cloth pay envelope. The envelopes are kept by the job foreman until the work is completed and are then turned in at the office and checked against the weekly time sheets before they are filed. The weekly pay sheets are forwarded to the office immediately after each pay day.

The company would much prefer to pay by check, but the agreement with the local labor organization requires that wages be paid in cash. On distant work deposits are made in a bank in that city to provide the foreman on the job with funds to meet his payroll.

The image displays three distinct payroll forms used by the John R. Proctor Company.
 1. **Weekly Time Sheet**: A form for recording work hours over a week. It includes a header for 'WEEKLY TIME SHEET' and 'FOR THE WEEK ENDING' followed by a date line. Below this is a grid with columns for 'NAME', 'JOB NO.', 'JOB NAME', 'POSITION', 'HOURS', 'DAYS', 'TOTAL HRS.', 'WAGES', and 'AMOUNT'.
 2. **Daily Time Card**: A smaller form titled 'DAILY TIME CARD' with a header for 'NAME' and 'JOB NO.'. It contains a grid for recording daily work hours and wages.
 3. **Pay Envelope**: A form titled 'PAY ENVELOPE' with a header for 'NAME' and 'JOB NO.'. It contains a grid for recording wages and a section for 'AMOUNT PAID'.

Pay Roll Forms

Left—The Weekly Time Sheet. Lower Right—Daily Time Card. Upper Right—Pay Envelope with space for Twenty-eight Pay Days

man on each particular job. The figures are then entered on a weekly payroll sheet and at the end of the week the amount due each man is computed and entered on the face of a cloth envelope 4 1/4 in. by 9 1/2 in. This is arranged for twenty-eight paydays. When

man has engaged on during the day. Information on this is conveyed by means of a symbol printed in a book of instructions given to each foreman and superintendent. All the usual operations of electrical contracting are symbolized and the home office can tell at

Bulletin on Strikes Against Open Shop Products

A bulletin entitled "Building Trades Strikes Against Open Shop Products Are Unlawful," containing a summary of several court cases and decisions on the subject, has been issued by the League for Industrial Rights, 165 Broadway, New York City. The cases described are the Bedford Stone case which went to the United States Supreme Court, who rendered a decision on April 11, 1927, the Decorative Stone Company v. Building Trades Council of Westchester County case and a number of Massachusetts cases. Copies of the bulletin may be obtained by writing to the League.

Chats on the National Electrical Code

*A Monthly Discussion of Wiring Practice and Questions of Interpretation,
Presented with a View Toward Encouraging a Better Understanding of the In-
dustry's Most Important Set of Rules*

Conducted by F. N. M. SQUIRES
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

Cutouts on Ceilings

In a recent questionnaire to eastern electrical inspectors the question was asked: "Do you allow cutouts to be located on ceilings of average heights?" Of thirty-three replies twelve answered "Yes" and twenty-two "No."

In some localities it used to be customary to allow cutouts to be installed on ceilings. In almost all such cases the inspectors required a substantial catch to keep the door closed and very often springs or spring hinges were also required. Some inspectors looked at it from a safety to life standpoint and would not approve of their installation on the ceiling unless the cover, when open, would be high enough not to hit the head of a person passing underneath. In some districts the requirements that the cutouts, if installed on the ceiling, be at least 7 ft. above the floor still exists.

The Code for several years has required that cutouts be "readily accessible." What this meant, though, was left to the judgment of the individual inspector until the 1923 Code began giving definitions. The definition of readily accessible is given as "able to be reached quickly without climbing over or removing obstructions or resorting to chair, box or portable ladder." As the average ceiling is 9 ft. above the floor, it is evident that any cutout placed thereon could not be reached without resorting to box, chair or portable ladder. Therefore, it would not be readily accessible and hence cut-

outs must not be located on ceilings of average height.

But does the Code allow cutouts on ceilings if they are within easy reach?

It does, providing, however, that (805f) *special precautions* be taken to prevent fuses falling out, or switches opening, due to vibration or other causes. Also, the doors or covers of such ceiling mounted boxes shall be so arranged as to prevent their accidental opening.

Fixtures Equipped With Attachment Receptacles

Attention has been called to fixtures which are now appearing on the market having an attachment receptacle incorporated with the body of the fixture, but connected to the circuit wiring through the fixture wire which is generally a No. 18 or No. 16.

The use of No. 18 should be prohibited because of the lack of carrying capacity. These fixtures are designed chiefly to be used in locations near where heating appliances will be required and as most of these now employed consume around 500 or 600 watts the No. 18 fixture wire would be seriously overloaded.

No. 16 wire, capable of safely carrying 6 amp. might, in some cases, just come within the requirements if there were not too many other sockets on the fixture. But as a general rule attachment receptacles should be fed by means of wires not smaller than No. 14.

It would be well that careful consid-

eration be given to this matter before the market becomes flooded with these fixtures.

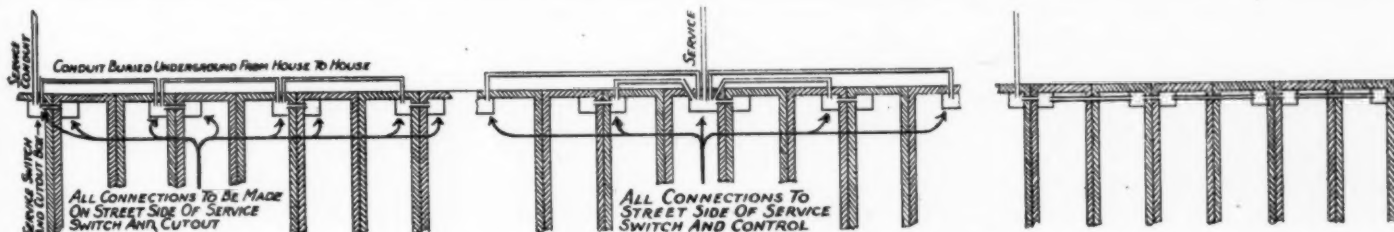
When Is a Building More Than One Building?

Rule 401-b requires that a service shall not supply more than one building except in properties under single occupancy or management, or if the service is kept out of all buildings but those served. A structure may extend for an entire block and be arranged to house several families and stores and have several entrances which do not communicate with each other. The question so often asked is, "Have we here one building and will one service do or have we several buildings into which separate services must be run?" Naturally the contractor is perplexed to know whether to treat it as one building or as several separate ones.

The Code defines a building as "A structure which stands alone or which is cut off from adjoining structures by unpierced fire walls."

Evidently, then, a frame structure covering an entire block may be fed from one service. This is true if the entire structure is under one management or ownership and has no unpierced fire walls separating it into smaller units.

And to settle several arguments about unpierced fire walls may we explain here that a fire wall may have a doorway through it and still be considered as unpierced if the opening is closed by



Methods of Running Services to Row of Houses, Third Method Not Recommended Unless Buried Under 2 Inch Concrete

means of automatic *approved* fire doors on both sides of the opening.

Therefore, the contractor must ascertain the details as to ownership or management and also as to construction. And a fire wall to be a fire wall must be unpierced (except as noted above) from the bottom of the basement to above the roof.

On the previous page are given sketches of how services may be run to a row of houses.

Neutral Wire Size

Comment and complaint has reached us that in some localities the contractors are required to run not smaller than a No. 8 wire as the neutral of a service, even though the entire load on this service may be 10 or 15 amp. And this requirement was supposed to be according to Code rules.

The explanation given for this was that Rule 905-g-h required that the grounding conductor in no case be smaller than No. 8 and that upon attaching the grounding wire to the neutral the latter then became the grounding conductor or a part of it and must also be at least No. 8.

It was not the intent of the framers of the Code to make such a requirement and we believe the Code should not be so construed, for Rule 404-a says that the service wires "shall not be smaller than No. 10," but makes no statement nor reference that the neutrals should be of a larger minimum size. If the intent of the Code was to require the No. 8 some mention or note or reference would surely have been made of it in Section 404.

This neutral wire, while it is grounded wire, must not be confused with a "system ground wire" mentioned in 904-d, for the purpose of the neutral wire is not to carry a ground nor to be grounded, but to provide a balance wire (as it was originally called) for a 110-220 volt system. After fulfilling this purpose it becomes a convenient wire to ground in order to keep the system "voltage to ground" at a minimum.

The Code requirements, therefore, are fully complied with if, where No. 10 wires are used for the potential wires of a service, the neutral also is No. 10, but grounded at the service entrance box by means of a No. 8 ground wire.

In direct opposition to the matter complained of above there has been

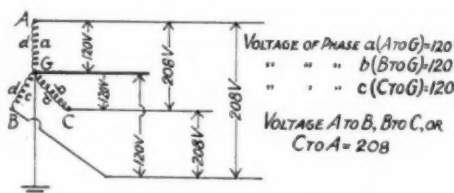
quite some discussion on the use of a diversity factor governing the size of a neutral wire and we believe some local ordinances provide for this.

In one instance tests of several days' duration were made of current demands of characteristic buildings by means of recording meters. The readings were checked against the known total connected load of the building and the results clearly showed the large economic loss of copper which was installed but not being called on to "do its stuff." Of course, if any particular house had staged an Old Home Week celebration the feeders would have been there to meet the conditions, but we wonder how much copper is wasted when sufficient is installed to carry the total connected load of some of our large buildings such as apartments, etc.

The New 3-Phase 4-Wire System

The 3-phase 4-wire system of distribution is working out very successfully in many ways.

The lighting companies report that it



Three Phase 4-Wire System

is advantageous to them beyond their expectations and of great benefits to their customers. But there are some precautions which must be given consideration by architects, engineers, contractors and inspectors in its use.

Great care must be especially exercised in converting old equipments using 3-wire 110-volt-220-volt systems to the new system. For these it is quite generally necessary to use polyphase meters, as the 110-220 voltage system is only obtained by the use of two phases, and the voltage on these is 120-208.

In new buildings which are to be fed from the 3-phase 4-wire system, all branch circuits which are to be supplied through one meter, and whose total load is less than 50 amp., must be wired 2-wire, as the lighting companies are supplying 3-wire (which of course are polyphase) meters only on loads of 50 amp. or over. Of course, where polyphase meters are used, 3-wire circuits may be employed.

In a building recently wired the contractor, in order to give his customer a good job, provided two circuits in each apartment using a 3-wire circuit and ran the 3-wire line to the meter bank in the basement. As the load on each apartment was small the lighting company would furnish only single phase meters which are 2-wire. The contractor then was put to the necessity of installing branch cutouts in each apartment in order that the run to the meters could be used as a feeder (using only two wires of the three). As the building by this time was practically complete considerable expense was thrown on this contractor.

Heating Appliances or Electrically Heated Appliances

Article 16 of the Code now deals with electrically heated appliances. In 1920 Article 16 was headed "Heating Appliances." Why the change and "How?" To what degree must an appliance become heated to come under the category as mentioned in the present Code? Most motors become "hand warm" after running some time. What effect has this on fans, blowers, hair clippers, adding machines, etc.?

But to become serious, and to get to the matter we have in mind, have you noticed some of the new "B Eliminators" for the Radio? They are not intended to be sources of heat, but they might help out on a cold night.

And some of them are "approved" too! But we believe they are safe enough from fire if properly treated. The approval was issued on them as units by themselves which meant that they were tested alone and in a place and position where plenty of air and ventilation was obtained. But now we find them housed in a wooden box, cabinet or console and no thought of ventilation given. They are now "heated" all right and unless some precautions are soon taken something is going to happen.

And then, too, aside from the dangerous temperatures which have been observed in several instances there is also the danger from the high voltages. These voltages are now reported as reaching up to a maximum of 1,000 volts. Many of the vacuum tubes in use now will take 250, 350, 500 and up to 750 volts on the plates and in order to take care of the drop across the rectifier and obtain the output wanted a

higher voltage than the output must be provided by the transformer.

As the output is of small capacity the devices are fairly safe if used carefully and if the manufacturers' seals are left unbroken, which means that the insides of the works are not tampered with. But the average curiosity is so keen to see what "makes it go" that seals mean little to a great many.

Let's endeavor to have care used in manufacturing and handling these devices and proper warnings given to the users. Why let the matter drift along until someone gets hurt? Safety first!

Bushings

The use of bushings to protect wires from abrasion in armored cable, conduit and metal raceway work has long been a bone of contention. The manufacturers say that they make them to be used, not looked at, and because they are required. Contractors try not to be bothered with them and claim the Code is not specific enough in requiring them. Inspectors claim they must be used but very often are lax in seeing that they are used.

The types of bushings referred to are the brass ferrules or thimbles used in switch and receptacle boxes on the ends of armored cable; the bushing, generally iron, used on conduits on the inside of all boxes, and the bushings, generally brass, used with metal moulding at junction or outlet fittings.

All of these types are small and inexpensive and the manufacturers' profits must be small and the trouble of handling them large, so that unless they were a necessary item it seems as though the manufacturer would hardly bother with them.

Has the contractor a legitimate "kick" with the Code? Rule 503g says that "where a conduit enters a box or other fitting an approved bushing shall be provided to protect the wire from abrasion unless the box provides the protection. Not much chance for argument here.

Rule 504d requires that "metal raceways and their elbows, couplings and similar fittings shall be so designed that the sections can be * * * coupled together while protecting the wires from abrasion." This does not quite so clearly and specifically demand the bushings, but the manufacturers instead of making the fittings in such a way that the raceway fits into a certain in-

tegral part of the fitting provides a bushing which may be slipped over the end of the raceway to protect the wires from abrasion and the raceways are only approved by the Laboratories with these bushings included as part of the equipment. But we must admit that the Code here could be more definite.

The Code itself has a word to say to rebuff the criticism, and it needs to say something, for we next come to Section 505—Armored Cables—where the Code forgets to call for the thimbles or ferrules which sixty-two inspectors out of sixty-seven in a recent questionnaire say they require. And there is really no question but what they are needed here as is evidenced by the razor-like edges left on the armor of a cut armored cable.

But here is the Code's own argument:

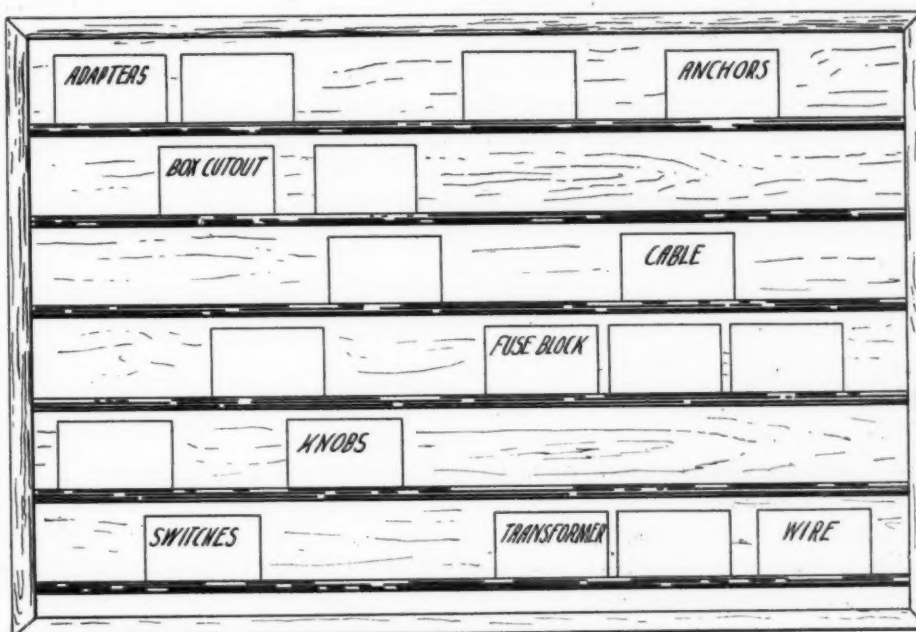
611. General Requirements for Use of Conductors.

j. Where exposed to mechanical injury, wires shall be suitably protected.

Doesn't that cover a multitude of cases?

There are no restrictions on that. We can ask for protection wherever we can prove there may be exposure to mechanical injury.

Just a further word on the omission of these bushings on armored cable. If the effects of these razor-like edges of the armor on the insulation of the wire due to vibration could be more often seen (it is generally the fire investigators who see this—if there is much left to see—) neither the contractors nor the inspectors would be lax in insisting that the bushings be fastened in place in every single instance where required.



Convenient Visible Record of Current Prices

A BOARD on which price cards of materials are placed is used by H. C. Heidrich, president of the Electric Motor & Repair Company, 264 Halsey Street, Newark, N. J., to facilitate the work of estimating.

The board, which is about 5 ft. long by 3 ft. high, is fastened to the front of Mr. Heidrich's desk. Across the front of the board have been nailed thin strips of wood, so arranged that they will hold small cards containing the

prices of various materials entering into a job. Each card is given over to a single item, and the current price written on the card as it is announced by the manufacturer. Sufficient space is available on the board to include every necessary item.

Mr. Heidrich says that the board has saved him much time in preparing estimates and eliminates the necessity of looking through catalogs in search of price data. The board is shown above.

The Electragist

Official Journal of the
Association of Electragists—International
S. B. WILLIAMS
Editor

Lower Priced Wiring

An effort has again been made to interest influential electrical interests in a modification of a low priced European wiring method. This latest importation consists of a small diameter cable which can be buried in the plaster of an ordinary room partition.

It probably will not see light again in this country but it is most discouraging to have this continued demand from one source for cheap wiring materials. But more discouraging is the fact that one of the most, if not the most, active promoters of this new method is one who voted for the Industry Wiring Conference report this spring.

The electrical industry has always been committed to the policy of lower prices to the public and no part of the industry has done more than the electrical contractor in this direction. It has also been the policy of this industry to give the public the best service it could. This service cannot be secured over cheap wiring materials.

There is only one way to reduce wiring costs and that is to eliminate waste—waste caused by labor, by materials that use too much labor, by the wrong kind of tools, by improper workmanship. We are constantly making progress in this direction.

Why are certain people so blind? They don't see the plumbing people searching Europe and Asia for the cheapest kind of plumbing.

A few more breaks like this will only cause a wider breach in trade relations than ever—and just at a time when we need to work together.

Thirty Years Old

It was thirty years ago that the National Electrical Code came into being. During the period from 1897 to 1927 the electrical industry has given freely of its best engineering thinking to the development of this Code.

The National Electrical Code while not perfect represents earnest and honest endeavor. There is no partisanship in our Code. Efforts have been made to make the Code subservient to certain interests but always these efforts have failed.

There have been attacks upon the Code and, doubtless, many more will be made but each attack leaves the Code stronger than ever.

Improvements are constantly being made in the Code

and of late years these improvements have won many over to the Code who formerly were merely luke warm, especially amongst the municipal inspectors. We look forward to the day when the National Electrical Code will be the basis of all local regulation.

Consolidations

In the fields of power production, of manufacturing and of jobbing, the order of the day is consolidation. These mergers have resulted from the demand for greater production at smaller cost. If the principle is sound for the other branches of the industry, why not apply it to the electrical contractor and dealer field?

This question is being asked quite frequently. It is being asked within our own ranks and without. In fact, it has been pointed out as one answer to the problem of cheap competition.

It may be that consolidations in our field will prove to be economically sound and advantageous to the merging concerns, but we must not lose sight of the fact that there are certain inherent economic differences between the retail and wholesale trades. To argue that because others can do it profitably we should try it also, is not particularly sound reasoning.

Contractors or contractor-dealers who are contemplating mergers should first ask themselves two questions:

(1) Would the new company consolidate its purchases in order to earn the maximum discount and if so would it not thereby encourage the other jobbers to set up new contractors in order to maintain their volume?

(2) And if so, could the new company keep all of the business of the concerns merged?

In other words, it takes so little capital to engage in the contractor or contractor-dealer business that there is no assurance that a merger will at all reduce the field of competition. It might be, of course, that the consolidation could parcel out its orders and still retain all the advantage of its buying power, but if it had materially reduced the competitive field in numbers it would merely be an invitation to some "gyp" or "pirate" jobber to enter the field.

Big, successful contractor and contractor-dealer businesses have been built, and built in the face of the most strenuous price competition, but not by mergers. They have made the grade because of management, sound thinking,

common sense, the willingness to work, the ability to sell, the insistence on good workmanship, the creation of the right kind of public and customer relations.

These principles are necessary in any business, if it is to be successful. Without them a merger would not succeed no matter what its size. If concerns are having difficulty let them look inside and see whether the trouble is not with the boss. If men have not ingrained in them the above enumerated business principles no merger in the world will give it to them. Mergers will not correct human faults.

It is possible to pool certain activities in one place and participate in the cost, such as the quantity survey plan now starting in New York, or such as partaking of the services of an accountant as is done in Milwaukee, California and elsewhere. But you cannot pool poor business brains and expect to find anything better.

Wire Lubricants

What is the best thing to use on wire when pulling through conduit to make it pull easier? This subject is now before one of the article committees with the probability that a rule governing it will be proposed for inclusion in the Code in the 1928 revision. The subject came to a head through the use of soft soap on a recent job and the demand by the inspection department that the wires be removed and the conduits swabbed out before approval would be given.

At the present time Underwriters' Laboratories has approved a brand of soap flakes for this purpose but the intimation is that the article committee may go farther and suggest only the use of soapstone.

The difficulty, of course, lies in two directions: (1) The sticky braid on the wire and (2) the fact that free alkali is injurious to the rubber insulation.

Some brands of wire are made with a fairly slick surface, but there are a great many approved brands that are very sticky and especially so in warm weather. These wires cannot be pulled any distance without something to ease them through.

This sticky condition means that more force has to be used to pull the wire and on long pulls there is the possibility of breaking the insulation and of lessening the wire diameter. The hazards involved are such that there should be a rule requiring a reasonably slick surface on approved wire.

As for a lubricant it is probable that soapstone is not the only thing that might properly be used. There are certain brands of soap flakes that contain virtually no alkali and which work well. Soft soap, however, is out of the question. It should never be used.

This is the first time that any serious attention has been given to the matter of wire pulling. It is a very small beginning but it is hoped that it may take on a large aspect.

There is nothing for instance to indicate that the present rules regarding the number of conductors in the different conduit sizes are right. There should also be some

study with respect to the allowable pull on rubber covered conductors.

When these matters are more fully understood it might mean an additional expense in wiring materials, but it will also mean a much lowered labor cost.

Illegal Labor Interference

Several times this year our courts have ruled against efforts of organized labor in the building trades to prevent by means of strikes the use of non-union made products. Such efforts have been declared illegal.

At different times in the last year or two there have been complaints that electrical workers were attempting to dictate the employment policy of manufacturers of lighting fixtures and other electrical equipment.

The decisions of the United States Supreme Court in the Bedford Stone case; of the United States District Court in the Decorative Stone case and of the Supreme Court of Massachusetts with respect to interference by the Carpenter's Union with non-union made doors, sash and trim, all handed down this year, are unmistakable. The courts will now be quick to enjoin a union from so hindering or preventing the free marketing of commodities, especially where goods manufactured in another state are involved.

Arguments

When there is an unfortunate trade situation in a community between the contractors and dealers and the central stations there is nothing to be accomplished by trying to place the blame. In all probability there is much to be said on both sides.

The real task is to correct the situation and get going to a fresh start. So long, however, as the time is taken up arguing back and forth as to who is wrong nothing constructive will be accomplished and it will be just so much harder later to iron out the situation.

The utilities are fast coming to believe that their competition is not within the industry but without, and that to meet this outside competition for the public's dollar all the electrical people must stand together.

Contractors and dealers must learn the same lesson.

We can do more together to combat the competition of outside lines than we can scrapping internally.

Red Seal Nationalization

Recommendations have been made for the nationalization of Red Seal. Fine!

If these recommendations are adopted by the Society for Electrical Development it will mean national specifications, national advertising and the granting of a certificate to a house wired according to Red Seal specifications anywhere.

The Society is trustee for the Red Seal Plan and as such should do everything possible to nationalize its use.

Association of Electragists INTERNATIONAL

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Conventions and Meetings
C. L. Chamblin,
687 Mission St., San Francisco, Calif.

Publication
L. K. Comstock,
21 East 40th St., New York City

Cost Data
J. H. Schumacher,
187 Portage Ave., Winnipeg, Man.

Radio
E. C. Headrick,
87 Broadway, Denver, Colo.

Credit and Accounting
J. F. Buchanan,
1904 Sansom St., Philadelphia, Pa.

Red Seal
C. L. Chamblin,
687 Mission St., San Francisco, Cal

Electragists' Data Book
J. H. Schumacher,
187 Portage Ave., Winnipeg, Man.

Standardization
L. E. Mayer,
14 No. Franklin St., Chicago, Ill.

Legislation
G. E. Shepherd
11 W. Market St., Wilkes-Barre, Pa.

Trade Policy
W. Creighton Peet,
70 E. 45th St., New York City

International Relations
R. A. L. Gray,
85 York St., Toronto, Canada

Wiring Methods
G. E. Shepherd,
11 W. Market St., Wilkes-Barre, Pa.

Past Presidents of the National Electrical Contractors' Association

Charles L. Eidlitz1901-1903
E. McCleary1903-1905
James R. Strong1905-1908
Gerry M. Sanborn1908-1910

*Marshall L. Barnes1910-1912
Ernest Freeman1912-1914
John R. Galloway1914-1916
*Deceased

Robley S. Stearnes1916-1918
W. Creighton Peet1918-1920
James R. Strong1920-1925
Joseph A. Fowler1925-1927

PRESIDENTS AND SECRETARIES OF STATE ORGANIZATIONS

State	President	Secretary
British Columbia:	C. H. E. Williams, 509 Richards St., Vancouver	J. C. Reston, 579 Howe St., Vancouver
Alabama:	J. R. Wilcox, 2017 First Ave., Birmingham	D. B. Clayton, Am. Trust Bldg., Birmingham
Arkansas:	Ed. Appler, 901 Central Ave., Hot Springs	Clem. Dresse, 316 Louisiana St., Little Rock
California:	H. H. Walker, 1323 Venice Blvd., Los Angeles	C. J. Geisbush, 610 Cotton Exchange Bldg., Los Angeles
Colorado-Wyoming:	Matt Whitney, Colorado Springs	P. Harry Byrne 965 Madison St., Denver
Florida:	W. S. Monroe, 308 Cass St., Tampa	P. F. Lyons P.O. Box 992, Tampa
Illinois:	Edgar Rice, 207 East Broadway, Alton	John Kuhlemeyer 1317 S. Sixth Ave., Maywood
Indiana:	F. O. Broyles, 119 W. Fourth St., Marion	Ralph Brassie 639 Main St., Lafayette
Iowa:	Earl N. Peak, 1603 W. Main St., Marshalltown	J. R. Payton, 13th & Walnut Sts. Des Moines
Kansas:	L. M. Atkinson, 116 E. First St., Pittsburgh	Harry Hagler Salina

State	President	Secretary
Louisiana:	Robley S. Stearnes, 628 Carondelet St., New Orleans	I. G. Marks, 323 Chartres Street, New Orleans
Maryland:	A. C. Brueckmann, Keyser Bldg., Baltimore	W. D. Young, Calvert and Franklin Sts., Baltimore
Michigan:	W. F. Fowler, c-o Barker-Fowler Electric Co., Lansing	E. P. Blackman, c-o Motor Shop, Battle Creek
Missouri:	Charles J. Sutter, 1303 Pine St., St. Louis	W. F. Gerstner, 120 North Second St., St. Louis
New York:	A. Lincoln Bush, 906 6th Ave., New York City	H. F. Janick, 235 Berlin St., Rochester
North Carolina:	H. R. Bouligny, P. O. Box 534, Charlotte	W. P. Christian, Greensboro
Pennsylvania:	W. V. Pangborne, 1927 W. Montgomery Ave., Philadelphia	M. G. Sellers, 1202 Locust St., Philadelphia
South Dakota:	Mark J. Hurlbut, Chamberlain	Frank Shuff, Yankton
Tennessee:	R. L. Clift, Memphis	J. A. Fowler, 118 Monroe Ave., Memphis
Texas:	T. L. Farmer, 1809 Main St., Dallas	J. W. Read, 715 Capitol Ave., Houston
Wisconsin:	L. W. Burch, 202 E. Wash'n Ave., Madison	

List of Local Associations

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS	STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
ALABAMA			NEBRASKA		
Birmingham (C)	J. R. Wilcox	2017 First Avenue	Lincoln (L)	George Ludden	1329 N Street
ARKANSAS			Omaha (C)	E. H. Brown	1818½ Harney Street
Fort Smith (C)	Edward Ryan	Ft. Smith Lt. & Trac. Co.	NEW JERSEY		
CALIFORNIA			Elizabeth (L)	A. G. Otis	Broad Street
Fresno (C)	Clyde L. Smith	1162 Broadway	Jersey City (C)	John Nairn	38 Oakland Ave.
Glendale (C)	W. L. Hyde	154 S. Brand Blvd.	Long Branch (C)		
Long Beach (L)	V. Ringle	So. Cal. Edison Co.	(Asbury Park and Red Bank)		
Los Angeles (C)	Helen I. Mikesell	1009½ S. Hill St.	Newark (C)	Austin Hurley	Campbell Ave., Long Branch
Oakland (C)	Laurence R. Chilcote	Hobart & Webster Sts.	Paterson (L)	Paul H. Jaehnig	435 Orange Street
Pasadena (C)	H. W. Barnes	1331 N. Lake Ave.	Philipsburg (See Lehigh Valley, Pa.)	George Pape	43 Fair St.
Sacramento	L. W. Sherman	910 Ninth St.	Union City (C)		
San Francisco (C)	E. E. Browne	522 Call Building	NEW YORK		
Santa Ana (C)	O. N. Robertson	303 N. Main St.	Buffalo (L)	Frank Zeller	328 48th Street
Eureka (C)	J. H. Hilfiker	1717 H Street	Brooklyn (C)	W. E. Prosser	87 W. Tupper St.
COLORADO			Jamestown (C)	H. F. Walcott	60 Third Avenue
Colorado Springs (C)	Matt Whitney	208 N. Tejon St.	Nassau-Suffolk (C)	Henry M. Lund	309 Main Street
Denver (C)	E. C. Headrick	89 Broadway		Henry T. Hobby	55 Front Street, Rockville Centre, L. I.
Pueblo (C)	E. F. Stone	So. Colorado Power Co.			
CONNECTICUT					
Hartford (C)	A. A. Angello	473 Park St.	New York City	Walter Knapp	207 East 43rd Street
Waterbury (C)	D. B. Neth	107 West Main St.	Section No. 1 (C)	Albert A. A. Tuna	127 East 34th Street
Bridgeport (C)	L. E. Finch	529 Newfield Bldg.	Independent (C)	George W. Neil	96 Beekman St.
DIST. OF COLUMBIA			Metropolitan (C)	E. M. King	515 Niagara Street
Washington (L)	P. A. Davis	1328 Eye St., N. W.	Niagara Falls (C)	Theo. T. Benz	278 State Street
FLORIDA			Rochester (C)	Richard Spengler	421 McClellan Street
Bradentown (C)	W. S. Stewart	W. & S. Elec. Co.	Schenectady (C)	Fred P. Edinger	802 East Water St.
Daytona Beach (C)	C. Leotah Benson	324½ S. Beach St.	Syracuse (C)	W. C. Balda	228 Genesee Street
Deland (C)	C. W. Allcorn	132 No. Florida St.	Utica (C)	Jack Lalley	14 Mnr. Hsc. Sq., Yonkers
Fort Myers (C)	P. K. Weatherly	Thompson-Weatherly Co.	Westchester Co. (C)	Louis Mayer	485 South Broadway
Indian Riv. Dist. (C)	L. A. Paige	Vero Beach	Yonkers (C)		
Jacksonville (C)	W. A. Harper	108 W. Bay St.	OHIO		
Miami (C)	E. A. Robinson	118 N. W. First Ave.	Akron (C)	E. C. Rishel	540 East Avenue
Orlando (C)	Solon M. Lantz	833 E. Concord	Canton (C)	H. S. Hastings	301 New Vickery Bldg.
St. Petersburg (C)	Gardiner Blackman	P. O. Box 992	Cincinnati (C)	J. F. Riehle	1642 Cedar Ave.
Tampa (C)	P. F. Lyons	73 Walton St.	Cleveland (C)	F. T. Manahan	Chester Twelfth Bldg.
GEORGIA			Columbus (L)	O. A. Robins	1242 Oak Street
Atlanta (C)	B. K. Laney	Byck Electric Co.	Lorain (C)	A. B. Walton	3150 E. Erie Ave.
Savannah (L)	Sylvan M. Byck		Toledo (C)	Fred C. Dunn	Builders' Exchange
ILLINOIS			Dayton (C)	Clarence Carey	1107 South Brown St.
Chicago			Massillon (C)	F. D. Mossop	c-o Mesco Electric Co.
Electrical Contractors' Association	J. W. Collins	228 No. LaSalle St.	Northern Ohio (C)	R. A. Wentz	Elyria
Master Elec. Contractors' Association			OKLAHOMA		
Decatur (C)	F. J. Boyle	304 S. Halsted St.	Pawhuska	C. G. Sego	Pawhuska
Granite City (C)	Earl Weatherford	114 East William St.	Portland (C)	J. R. Tomlinson	51 Union Ave. N.
Peoria (C)	William W. Huxel	1254 Niedringhaus Ave.	PENNSYLVANIA		
Rockford (C)	L. B. Van Nuys	238 So. Jefferson Ave.	Altoona (C)	Walter Bracken	Leechburg
Springfield (C)	Donald Johnson	106 North Second St.	Allegheny Valley	E. G. Jackson	12 West Third Street
Wheaton (C)	A. D. Birnbaum	916 West Cook St.	Du Bois (C)	C. E. Blakeslee	12 E. Long Av.
INDIANA	E. C. Krage	133 West Front St.	Erie (C)	R. D. Goff	11th and French Sts.
Lake County (C)	A. R. Irwin	3461 Mich'n Av., Ind. Har.	Lehigh Valley (C)	A. W. Hill	Bethlehem
Indianapolis (L)	A. W. Kruege	2405 E. Tenth St.	Philadelphia (C)	M. G. Sellers	1202 Locust Street
Michigan City (C)	Walter A. Sassodeck	913 Franklin St.	Pittsburgh (C)	D. A. Fleming	518 Empire Bldg.
Muncie (C)	Harry McCullough	113 W. Howard St.	Wilkes-Barre (L)	Leon N. Sell	Town Hall
South Bend (C)	R. A. Frink	1338 Howard St.	RHODE ISLAND		
Terre Haute (C)	C. N. Chess	523 Ohio St.	Providence (C)	H. E. Batman	36 Exchange Place
IOWA			SOUTH CAROLINA		
Cedar Rapids (C)	H. E. Neff	94 First Ave., West	Charleston (L)	J. P. Connolly	141 Meeting Street
Davenport (C)	Louis F. Cory	510 Brady St.	SOUTH DAKOTA		
Des Moines (C)	R. C. Trembath	Bankers' Trust Bldg.	Sioux Falls	H. W. Claus	326 S. Phillips Ave.
Fort Dodge (C)	J. A. Paul	16 So. Twelfth St.	TENNESSEE		
Sioux City (C)	E. A. Arzt	211 Fifth St.	Chattanooga (L)	P. W. Curtis	725 Walnut Street
Waterloo (C)	R. A. Cole	Cole Bros. Elec. Co.	Knoxville (L)	Jerry G. Cason	303 West Church St.
KANSAS			Memphis (L)	J. J. Brennan	12-16 So. Second St.
Salina (C)	C. G. Loomis	814 Cedar St.	Nashville (C)	J. T. Shannon	c-o Electric Equip. Co.
Wichita (C)	P. W. Agrelius	Wichita	TEXAS		
KENTUCKY			Beaumont (C)	J. A. Solleder	Houston & Bolivar Sta.
Lexington (C)	J. H. Brock	235 East Main St.	Dallas (C)	P. B. Seastrunk	2032 Commerce St.
Louisville (C)	C. L. W. Daubert	921 South Third St.	Houston (C)	J. W. Read	715 Capitol Avenue
Paducah (L)	K. H. Knapp	c/o Paducah Electric Co.	UTAH		
LOUISIANA			Ogden	B. Kristofferson	2249 Washington Ave.
New Orleans (C)	I. G. Marks	406 Mar. Bk. Bldg.	Salt Lake City (C)	C. Louis Collins	215 Kearns Bldg.
Shreveport (C)	R. L. Norton	620 Marshall St.	VIRGINIA		
MARYLAND			Lynchburg (C)	J. L. Fennell	c-o Fennell & App
Baltimore (C)	A. P. Peterson	515 Cathedral St.	Norfolk (L)	A. W. Cornick	200 Plum St.
MASSACHUSETTS			Richmond (C)	E. M. Andrews	15 N. Twelfth Street
Lowell (C)	George A. Ryan	79 Middle St.	WASHINGTON		
Haverhill (C)	H. W. Porter	14 West St.	Seattle (L)	P. L. Hoadley	Seaboard Building
Malden (Medford, Everett and Melrose) (C) ..	H. J. Walton	c/o Malden Electric Co.	Spokane (C)	William Stack	W. 1121 Cleveland St.
Springfield (C)	C. S. Foster	220 Dwight St.	WEST VIRGINIA		
Worcester (L)	John W. Coghlin	239 Main St.	Wheeling	Peter J. Erb	1414 Eoff St.
MICHIGAN			WISCONSIN		
Detroit (C)	N. J. Biddle	112 Madison Ave.	Green Bay (C)	V. E. Grebel	531 S. Broadway
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S. E.	Madison (C)	Carl J. Marsh	710 Beaver Bldg.
Kalamazoo	E. R. Hummel	1121 Seminary St.	Milwaukee (C)	E. H. Herzberg	1604 Wells Street
Saginaw (C)	E. T. Eastman	209 Brewers Arcade	Racine (C)	Joseph J. Small	1910 Linden Ave.
MINNESOTA			CANADA		
Duluth (L)	Morris Braden	c-o Minn. Pow'r & Lt. Co.	Montreal (C)	George C. L. Brassart	674 Girouard Ave.
Minneapolis (C)	W. I. Gray	209 Globe Building	Toronto (C)	J. A. McKay	302 Excelsior Life Bldg.
MISSOURI			Vancouver (C)	J. C. Reston	579 Howe St.
Kansas City (C)	Walter C. DeBold	City Bank Bldg.	Winnipeg (C)	Fred Ball	300 Princess St.
St. Louis	W. F. Gerstner	120 No. Second St.			
Electragists' Ass'n (C)	G. L. Gamp	Wainwright Bldg.			
Electric Employers' Association (C)					

(C) designates exclusively Contractor-Dealer organization.
 (L) designates an Electrical League.

OCTOBER ACTIVITIES

Industry Sales Conference to Meet November 4

PLANs are progressing rapidly for an Industry Sales Conference to meet in New York on November 4, or as soon thereafter as possible, with representatives from the Association of Electragists, the National Electrical Manufacturers' Association, the National Electric Light Association and the Electric Supply Jobbers' Association. The call for the meeting was sent out by the Society for Electrical Development which will cooperate in an effort to secure a united program for electrical industry market development.

The Industry Sales Conference is the result of a recommendation of the Industry Conference on Wiring, last May, that a joint sales conference be held this fall and that the four national group associations each appoint delegations consisting of "five outstanding men who they believe will best represent the sales experience and the spirit and resourcefulness of their several associations to formulate a program for the promotion of the domestic market for house wiring, electric service and electric equipment in the homes of America."

Earl Whitehorne, who was chairman of the Industry Wiring Conference, in speaking of the proposed Industry Sales Conference, recently said: "With sixteen million homes in America, most of them inadequately wired, and with the wiring of houses in the hands of thirty thousand contractors, of whom only twenty-three hundred are nationally organized, the needs of the situation are obvious. The industry must set up a broad embrasive sales program—a five-year program at least, backed with an appropriation of not less than a million dollars a year and supported by the man power of the entire industry directed under a well co-ordinated plan. For the way must be found to rewire present connected houses for complete equipment and to establish a practice of adequately wiring new houses. And to accomplish this will require the organization of the contracting trade so that these 30,000 men who do the in-

dustry's wiring may be guided and educated to a better performance.

"It will require the promotion of uniformity in inspection, a further development of league work, the establishment of acceptable standards of merchandising for the electrical appliance trade, and a two-fisted campaign of popular advertising both national and local. It is a selling job. The houses must be adequately wired, refixed and then equipped with appliances—not some day, but now.

"There has never been an issue before the industry that has had such universal appeal. Such a program, successfully carried out, will develop a tremendous market for wiring materials, fixtures, appliances, small motors and all the meters, lines, transformers and station equipment that will be required to carry the added load. Power companies, manufacturers, jobbers, contractors and dealers naturally are all for it. The opportunity stares the industry in the face. All it needs is wise planning and courage to spend money to unloose this waiting business."

Joseph A. Fowler, Fowler Electric Company, Memphis, Tenn., has been appointed chairman of the Association of Electragists' delegation to the sales conference, the other representatives of which are: W. Creighton Peet, Peet & Powers, New York City, and chairman, Trade Policy Committee, A. E. I.; A. Lincoln Bush, Belmont Electric Company, Inc., New York City; J. T. Fryer, Berkshire Electric Company, Pittsfield, Mass., and W. H. Ochiltree, Ochiltree Electric Company, Pittsburgh, Pa.

The representatives from the other organizations are:

National Electric Light Association—Harry McConnell, Electric Bond & Share Co., New York; E. W. Lloyd, Commonwealth Edison Co., Chicago; R. F. Pack, Northern States Power Co., Minneapolis; M. C. Huse, The Philadelphia Elec. Co., Philadelphia; J. E. Davidson, Nebraska Power Co., Omaha.

National Electrical Manufacturers Association—W. E. Sprackling, Tubular Woven Fabric Co., Pawtucket, R. I.; H. T. Bussman, Bussman Mfg. Co., St. Louis; Robert Kuhn, American Electrical Heater Co., De-

troit; R. J. Russell, Century Electric Co., St. Louis; David Sarnoff, Radio Corporation of America, New York.

Electric Supply Jobbers' Association—G. E. Cullinan, Graybar Electric Co., New York; W. W. Williamson, Alpha Electric Co., New York; J. G. Johannesen, General Electric Supply Co., New York; C. McKew Parr, Parr Electric Co., New York; John L. Owen, E. B. Latham & Co., New York.

Local Electrical Leagues—J. E. North, The Electrical League of Cleveland, Cleveland; Earl Whitehorne, Electrical World, New York; R. Bourke Coreoran, The Electric Association, Chicago; D. C. Birdsell, Decorative Lamp & Shade Co., Philadelphia; H. A. Brooks, Potomac Electric Power Co., Washington, D. C.

National Motor Section Committee Appointed

A National Motor Section Committee for the Association of Electragists has been appointed to meet with the Motor Section Committee of the National Electrical Manufacturers' Association, in accordance with the action taken at the Electragist convention in St. Louis. The combined committee will try to suggest measures to improve conditions in the motor industry.

George H. Jacob, of the Miller-Seldon Electric Company, 1930 McGraw Avenue, Detroit, Mich., is chairman of the committee. The other members from the association are: Louis Kalischer, Brooklyn, N. Y.; James A. Feeley, Herbert S. Potter Company, Boston, Mass.; J. Roland Stolzenbach, Roland Electrical Company, Baltimore, Md.; Thomas G. Hodgdon, Franklin Electric and Construction Company, Pittsburgh, Pa.; Harry Donaldson, McArthur Electric Company, Chicago, Ill.; Henry Trester, Trester Service Electric Company, Milwaukee, Wis.; George P. Svendsen, Boustead Electric and Manufacturing Company, Minneapolis, Minn.; Fred E. Briner, Briner Electric Company, St. Louis, Mo.; A. Penn Denton, Denton Engineering and Construction Company, Kansas City, Mo.; L. M. Atkinson, Atkinson Armature Works, Pittsburgh, Kan.; W. W. Hanks, Charlotte Electric Repair Company, Charlotte, N. C.; S. J. Stewart, New Orleans, La.; W. M. Clower, Clower Electric Company, Dallas, Tex.; F. T. Broiles, International Electric and Ma-

chine Company, Los Angeles, Cal.; Frank O. Sievers, Coney & Kuchel Electric Works, San Francisco, Cal.

Plans to Broaden Red Seal Scope Recommended

Recommendations which will broaden the scope of the Red Seal Plan and make it national in application have been made to the directors of the Society for Electrical Development by its Red Seal planning committee. This is one of four planning committees which have made recommendations regarding the work of the Society for Electrical Development during the coming year. The others relate to codes and ordinances, leagues and field service and publicity and advertising services.

The Red Seal recommendations are:

That the Red Seal Plan should be continued in operation on a more adequate scale and with such changes in names, methods and specifications as may be adopted in the process of its reorganization:

That such revision of specifications, etc., should be shaped so that it may also influence the rewiring of homes already connected and using electric service but with inadequate facilities:

That the co-operation of the electrical national advertisers be secured to incorporate in their advertising some proper reference to the Red Seal Plan:

That an alternative license agreement be provided to make possible the operation and promotion of the plan in small towns and scattered territory, in which leagues could not be organized or supported, but in which the central station desires to promote the Red Seal Plan:

That an arrangement be worked out under which a Red Seal can be properly awarded, direct from headquarters, to any Red Seal home in unorganized territory, upon application:

That the Red Seal specifications be promptly standardized so as to have one uniform specification for the entire country, including present licensed leagues for the following reasons:

- (a) To eliminate increasing possibility of confusion in the public mind because of differing local Red Seal specifications in licensed territories.
- (b) To provide also a specification to apply in all unorganized territory.
- (c) To prepare the way for national advertising of a uniform, nation-wide plan.

The codes and ordinances committee recommended that a special effort be made to interest electrical leagues in the Uniform Electrical Ordinance as a part of their general activities.

The committee on league and field service included in its recommendations the following:

That an improved classification for leagues be adopted rating them as A, B, C, D, accord-

ing to the number of divisions (wiring, lighting, appliances, industrial) under which activities are provided in their respective annual programs. Further, that the rating be determined in advance each year by questionnaire:

That a simple form of constitution and by-laws for local leagues be prepared, in consultation with the League Council, and that it clearly state the league purpose:

That provision be made for a department head and at least five field men as the nucleus of a field service staff to be expanded as the need arises and funds permit:

That instruction manuals be prepared regarding general league activities, putting into available form league experience collected but

not compiled, and that a writer be added to the staff to do this work:

That the society issue at intervals a bulletin of league news and information to be sent to league officers and managers:

The committee on advertising and publicity recommended the appointment of two sub-committees—one to establish contacts between the four groups to obviate any possible duplication of effort: the other to consider future studies of the best method of handling several perplexing questions involved in the continuance of the advertising service as now constituted.

Good Attendance at Second California Electragist Convention

THE second annual convention of the California Electragists, held at Riverside, October 14 and 15, 1927, had an attendance of 250 people.

After opening remarks by Clyde L. Chamblin, president both of the California Electragists and of the Association of Electragists, International, in which he set forth the purposes of the convention, H. H. Courtright, Valley Electrical Supply Company, spoke on the "Through-the-dealer" plan of merchandising which he had previously presented at the national electragist convention in St. Louis in August.

To show the possibilities for self-education and self-improvement made available to all electrical contractors by means of their trade magazines, "THE ELECTRAGIST" and "Electrical West," W. A. Cyr, associate editor of the latter, gave an amusing talk under the title, "Maybe I Shouldn't Have Mentioned It."

The afternoon session was devoted to reports as to the actual work of the association. F. T. Broiles of the International Electric and Machinery Company reported the progress made by the motor section, C. J. Geisbush, state manager, California Electragists, reviewed the motor situation and the work of the National Motor Section in working out motor distribution policies with national manufacturers of motors and motor equipment. These policies, he said, were tending for the limitation of motor outlets to those qualified as to credit, character and capacity to serve; the reclassification of outlets and the maintenance of resale price schedules.

D. D. McFarlane, Newbery Electric Corporation, Los Angeles, read the re-

port of the merchandising section, in the place of its chairman, C. A. Rowley, of the McNally Company, Pasadena. The range situation, he said, was chosen by this committee for sole study this year. The crux of the problem, the electric wiring for ranges to be installed in already wired houses, was the chief item of discussion, an exhibit of a suggested standard layout being exhibited.

Paul Needham, electragist of Beverly Hills, read the report of the State Estimators' Section. In its self-educational activities this section makes a number of classes available to members, besides collecting useful data on engineering and labor problems. Classes in slide rule, plan reading, electric heating installation, ventilation, illumination, transformers and a.c. motors are planned. Cooperation with school authorities and architects and engineers is maintained and a publication, "The Estimator," is issued monthly.

J. R. Wilson, Quality Electric Works, Los Angeles, secretary of the Los Angeles section, then gave a demonstration of the type of work conducted by the section in its weekly meetings.

Saturday morning's session opened with a statement of position from the three major branches of the industry—power company, jobber, and manufacturer. On this part of the program appeared W. L. Frost, president of the Pacific Coast Electrical Association; H. L. Harper, chairman Pacific Coast Division, Electrical Supply Jobbers' Association, and R. M. Alvord, general district manager, General Electric Company, San Francisco.

A series of short talks followed, each of which was designed to show the pos-

sibilities for the contractor in developing new fields. These were from Harry A. Mulvaney, Majestic Electric Appliance Company, Los Angeles; A. G. Orear, district manager, Ilg Electric Ventilating Company, Los Angeles; G. H. P. Dellmann, San Diego Consolidated Gas and Electric Company, chairman of the Lighting Bureau, P. C. E. A., and Ray W. Turnbull, Pacific Coast manager, Edison Electric Appliance Co.

George Rankin, field representative, California Electrical Bureau, Los Angeles, gave "The Red Seal Story—Words and Music," in which he illustrated the results of a recent survey made by bureau men on the results of Red Seal efforts on 500 homes, not all of which converted to Red Seal, but all of which showed increased installation as a result of the sales effort.

The afternoon business session for members of the electragist organization began by reports from George Eldridge and H. W. Barnes, secretaries for the northern and southern divisions respectively, in which the field work of the association was discussed and the value of local organizations for the definition of local policies were stressed.

Election of officers followed, in which Harry H. Walker, Los Angeles, formerly president and last year vice president, was named president again for the next year. Edward Martin, Sterling Electric Company, San Francisco, was named vice president. C. J. Geisbush, state manager, was also named state secretary. On the finance committee Clyde Chamblin, retiring president, was named chairman.

New York Inspectors Elect Officers

The New York Chapter of the Eastern Association of Electrical Inspectors held their annual election of officers on October 3. Raymond Walker was elected chairman; J. E. Farrell, secretary-treasurer; C. J. Peacock, first vice chairman; F. W. Seymour, second vice chairman; W. L. Bond, Jr., third vice chairman, and M. F. Cody, Jr., fourth vice chairman.

Besides a general discussion of Code subjects there was authorized the forming of a committee on grounding to investigate conditions and formulate a uniform set of rules toward the unification of grounding methods, of which there has proven to be a wide diversity in this district at the present time.

Study Plumbing Trade Extension Plan

Laurence W. Davis, general manager of the Association of Electragists, and E. A. Beer, representing the Society for Electrical Development, are making a study of the trade extension activities in the plumbing industry, having visited recently the headquarters in Evansville, Ind.

For several years in the plumbing trade there has been a trade extension plan in operation for the benefit of plumbers and Mr. Davis and Mr. Beer are making a study of the operation and financing of that organization to see if a similar bureau in the electrical industry would be practical.

Ideal Home Lighting Equipment Exhibited

The ideal lighting equipment for a three-room apartment or home, exhibited at the New York Electrical Exposition, October 12 to 22, was one of the most interesting displays. The exhibit was arranged by experts on home lighting, and the fixtures shown by several

HOME LIGHTING EQUIPMENT EXHIBIT



Ideal Bedroom Lighting Exhibit

manufacturers were selected as the preferred types for the artistic equipment of a modern living room, dining room and bedroom. Every luminaire was required to pass prescribed specifications for satisfactory home lighting—artistic, efficient and not injurious to the eyesight.

Each of the three rooms was fitted with one ceiling fixture and four wall brackets, especially selected to suit the furnishings of the room.

There were five base outlets in each room and three switches, one controlling the ceiling fixture, one the wall fixtures and one the lamps through the base outlets.

Next to each room was a display room housing all the other approved types of fixtures for that particular kind of room. This method of displaying lighting equipment was very satisfactory and might easily be adapted to the show room of an electrical contractor-dealer.

Association Secretaries to Meet in Chicago

A conference of officers and managers of state, district and local contractor associations will be held in Chicago on November 14 and 15 at the Morrison Hotel. Arthur P. Peterson, secretary of the conference, will present a summary of local and state association work with a description of practices being carried on in various sections that have resulted in improved business conditions.

This material has been gathered from associations all over the country and covers such activities as accounting, credit and collection bureaus, estimating methods, group meetings, cooperative advertising and trade relations.

The conference of associations is an outgrowth of the conference of secretaries held in St. Louis at the Electragist convention in August. An attempt will be made at these meetings in Chicago to inform managers and secretaries of activities and successful ideas in use in some localities which might be tried with benefit in other sections.

New S. E. D. Field Representative

R. G. McPhail, formerly of the Electrical League of Rochester, joined the staff of the Society for Electrical Development on November 1 as field representative. Mr. McPhail was graduated from Harvard in 1915. He has been connected with the Red Seal campaign and league field work in Rochester.

New Code for Factory Lighting Nearly Finished

Progress has been made in the writing of the simplified lighting code for factories, S. G. Hibben announced at the convention of Illuminating Engineering Society which met in Chicago October 11 to 14. This new code is designed to make it easier for factory inspectors, who may not understand tech-

nical illumination terms, to inspect factories in accordance with the lighting illumination requirements of the American Engineering Standards Committee. The largest number of members of the society ever present at an annual convention attended this year and heard a number of interesting papers on illumination.

Baltimore Electragists to Hold Classes

Group meetings of Baltimore estimators will be resumed in November after the summer recess. These proved very successful last spring when a large number attended the sessions. A course of lessons on estimating, with practical estimating problems, has been laid out for the coming winter.

Contractors interested in business management and methods will also have classes in Baltimore this fall and winter. By the cooperative meeting method all who attend will receive information about sound business practices in use in successful contracting shops.

Electric Cooking Appliances Create No Fire Hazard

Electric ranges and cooking appliances cause virtually no fires according to a brief on the safety of electric cooking prepared by the Society for Electrical Development and presented to the mayor of New York and the tenement house law commission. The brief was prepared to show the lack of necessity for the New York ordinance prohibiting cooking in apartment hotels and supported the contention of the Society for Electrical Development that electric cooking appliances are perfectly safe in apartment hotels and kitchenettes and are, in fact, safer than any other kind of cooking appliances.

The society's brief contained statements from fire underwriters, inspectors and municipal officials in New York, Chicago, Philadelphia, Detroit and other leading cities. In presenting it Kenneth A. McIntyre, managing director of the S. E. D., wrote that, "Out of a total of 20,000 fires in New York last year, according to records of the New York Board of Fire Underwriters, only three minor blazes were traceable to electric cooking. Similarly, Chicago

with a fire bill of \$13,000,000 last year showed a total loss from electric cooking of \$410 or a ratio of .03 of one percent."

The Underwriters Association of the Middle Department reported that its territory showed absolutely no fires from electric cooking appliances, from 1924 to August 23, 1927. J. C. Forsyth, supervising engineer of the New York Board of Fire Underwriters, is quoted as saying: "After carefully reviewing our records I am of the opinion that an electrical range or electrical cooking apparatus properly installed and protected is the safest form of energy for cooking or heating that has so far been devised." Victor T. Towsley, chief electrical inspector of Chicago, wrote, "It would be my personal opinion that the fire hazard from these elec-

trical devices is very greatly under what it would be if other forms of heating devices were used, such as gas stoves, oil stoves, alcohol and similar devices."

The brief argues that restrictions against cooking in apartment hotels are unnecessary if electrical appliances or ranges are used. The S. E. D. makes a strong argument for uniformity in electrical inspection and favors "a suitable enabling act that will grant to the municipalities in the state of New York the right to adopt ordinances that will recognize the latest and most up to date issues of the National Electrical Code as approved by the American Engineering Standard Committee and the National Electrical Safety Code as approved by the American Engineering Standard Committee."

Electrical Inspectors Meet in East and West

TWO important electrical inspector conventions were held in October, that of the Eastern Association of Electrical Inspectors at Springfield, Mass., on October 12 and 13, and the Western section of the International Association of Electrical Inspectors in Toronto, Ontario.

The board of directors of the Eastern Association passed a resolution favoring the amalgamation of the association with the International Association of Electrical Inspectors, and suggested "that a committee be appointed to meet representatives of other associations to agree upon a mutually satisfactory form of constitution." When this resolution was announced to the members in attendance at the convention an informal expression on their part showed them to be unanimously in favor of the proposed action.

Nearly one hundred members attended the meetings in Springfield, and most of the time was devoted to the National Electrical Code, the discussion on each article being led either by the chairman or a member of the corresponding Article Committee of the Electrical Committee, National Fire Protection Association. Some matters relating to the early days of the Code were brought out in a talk by F. E. Cabot, former chairman of the Electrical Committee, and the Code of the future was discussed by A. R. Small,

present chairman. A. A. Packard of the Connecticut Electric Company gave an interesting demonstration on resuscitation. One of the outstanding features of the convention was an address on "The Year We Celebrate" (the thirtieth anniversary of the National Electrical Code) by C. M. Goddard, former secretary of the Electrical Committee. Other papers were on the present Code and problems of the future. W. C. Field was chairman of the local entertainment committee and an interesting program, including a luncheon, banquet and entertainment, was provided.

Western Inspectors Discuss Code

The National Electrical Code and the Canadian Electrical Code were the chief topics for the inspectors attending the Toronto meeting. The proceedings included reports on various sections of the Code. E. M. Wood of the Hydro-electric Power Commission of Ontario, S. W. Borden, grounding engineer Crouse-Hinds Company, and S. S. Hertz, Copperweld Steel Company, spoke on the subject of grounding; E. M. Ashworth, general manager of the Toronto Hydro-electric System, spoke about the importance of the work of the inspectors. F. A. Gaby, chief engineer of the Hydro-electric Power Commission, gave a brief outline of the development of the system in Ontario.

The discussions on the Canadian

Electrical Code were led by W. P. Dobson, chairman of the Electrical Code Committee of the Canadian Engineering Standards Association. He told the history of the preparation and adoption of the Canadian Code, which was based primarily on the National Electrical Code, and which includes two sections—(a) installation regulations covering both inside and outside work, (b) specifications for methods of testing and approving electrical material, devices and fittings to ensure that they are suitably designed and of proper construction. "The Canadian Code is an example of what can be accomplished by a gathering of representative men who are sincerely desirous of reaching agreement," Mr. Dobson stated. "It is confidently expected that the Canadian Code will shortly be universally adopted throughout the country."

A number of manufacturers had exhibits at the convention.

RED SEAL NOTES

Contest Serves as Survey

The Electric League of Washington, D. C., closed its Red Seal contest with fine results, and much invaluable information as to the situation between the electrical industry and the public in Washington. Six prizes, totaling \$300, were awarded, the first prize winner making a rating of 82 percent. From a review of the answers and many inquiries received the contest reached every class of people.

The contest also served the purpose of a survey of the conditions in Washington. As one of the questions asked was the number of light outlets and convenience outlets installed in the homes of entrants, the results indicated the big job the Washington League has to do to educate the people, not only to the convenience of electricity, but also to the fact that it is within the reach of everyone's pocketbook.

Pittsburgh Contractor Goes After Red Seal Work

W. P. Klein, Woodlawn, Pa., uses this striking layout to advertise his business—installing modern wiring systems in residences. Having received the letter from the Electric League of Pittsburgh, he reproduced it in the advertisement and thus accomplished two



things: he drove home the fact that he was doing high grade electrical wiring work and made a striking advertisement which undoubtedly received a lot of attention.

Demonstration Home in Poughkeepsie

A Red Seal demonstration home will be opened to the public in November in Poughkeepsie. By turning one switch at the door one can light each room on entrance and turn off the light in the

room one has just left. Illuminated door numbers will be visible at night. A built-in electric heater is installed in the bathroom; each bedroom will have an "invalid light" installed in the baseboard, giving them light in the room throughout the night. In the master bedroom a switch will turn on an exterior floodlight for burglar protection. Radio connections throughout the house and several telephone connections are among the conveniences.

Red Seal Increases Appliance Sales

The Electrical League of the Niagara Frontier, Buffalo, recently conducted an appliance survey in 128 homes, half Red Seal and half non-Red Seal, which indicated that Red Seal increases the use and sale of appliances. Red Seal houses, the survey showed, contained 35 electric ranges as against 21 for non-Red Seal homes; 27 refrigerators against 8; 60 vacuum cleaners against 53; 10 heaters against 4; 7 ironing machines against 4. The value of appliances per home was \$306 in Red Seal homes against \$240 in non-Red Seal houses, indicating that the Red Seal plan increases the use of appliances by 27½ percent.

Red Seal in Toronto Helps Refixturing

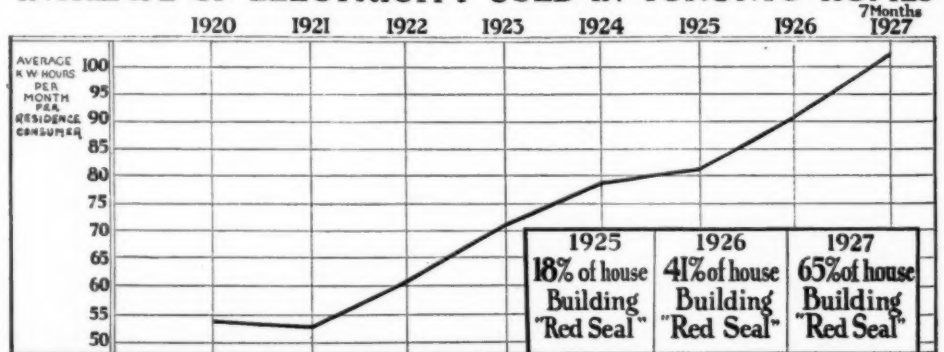
THE Electric Service League of Toronto reports that apartment houses without electric refrigerators and electric ranges can hardly be rented, and that old houses with obsolete wiring are at a market discount. The chart shows a growth in the use of electricity of 100 percent in seven years, with a particularly rapid increase since the beginning of the Red Seal plan.

Of houses erected in Toronto for the

first eight months of 1927 65 percent are wired according to Red Seal specifications.

In Toronto is one of the smallest Red Seal houses in the world. It is a four-room house with a living room, a combined dining room-kitchen and two bedrooms. There are 3 No. 4 wires in the service and 28 outlets in the house; there are four lights in the chicken house in the rear.

INCREASE OF ELECTRICITY USED IN TORONTO HOMES



Rochester Advertising Red Seal Homes

Under the heading "Red Seal Houses for Sale," advertisements are appearing in Rochester newspapers which are making the public conscious of the superiority of a thoroughly wired house. The Rochester Electrical League lists the Red Seal houses for sale in a weekly advertisement.

News Notes Concerning Contractor-Dealers

Harry Collinson, formerly in the electrical business in Los Angeles, Cal., has purchased the electrical business of Gordon E. Tujung on Sunset Boulevard in Glendale, Cal.

The Reliable Electric Works, Salinas, Cal., has changed hands. A. P. Hughes recently purchased the business from B. Bodycomb and he will conduct an electrical contracting and motor installation shop with day and night service.

New quarters for the Sengstacken Electric store, Lodi, Cal., have been completed and the firm is now installed in their model store. The building at 8 South School Street has been completely remodeled with new floors and fixtures, new decoration, modern show windows, and indirect flood lighting throughout the store. Charles Sengstacken, owner of the shop, has added a large line of appliances and is advertising an appliance repair service. His layout for the new store puts the show cases in the front of the store, with the smaller appliances where they can easily be seen, the lamp cabinets just to the rear, and the fixture show room

with cabinets for glassware in the back of the store.

Announcement has been made of the opening of a new radio and electrical shop in Livingston, Wis., by Lincoln Thomas and Oral Coyier.

The formal opening of the Electric Service Shop, Adrian, Mich., has just been held by W. J. Isaacson, W. J. Henning and A. Greaves. The front part of the building has been converted into a sales and display room, the repair shop being located in the rear.

E. A. Leonard and E. F. Mahany, formerly with the Delta Electric Company, have formed a partnership under the name Peerless Electric Company of Savannah, Ga. The firm will specialize in designing and construction of electrical installations for industrial plants and marine work. Armature winding, electric construction, lighting fixtures, testing and specifications will be handled.

The Stead Electric Shop has been opened in Covina, Cal., by Sam Stead. The store is stocked with many electrical appliances and repair work will be done in the shop.

Glen Sanders and A. L. Lee have opened an electrical service shop in Rensselaer, Ind., where they will do electric wiring, service radios and sell fixtures and accessories.

A new motor repair shop has been opened in Seattle, Wash., by Earl Carney.

Powell Brothers Electric Company of Paducah, Ky., are starting work on a new building which will be completed before Christmas. The plans call for an office and display room for lighting fixtures, radios and electric appliances. It will be one of the most modern electrical buildings in the south.

Joe Gentilman is shortly to open an electrical repair store in Corry, Pa., where he will do all kinds of electric wiring and carry a complete line of electrical fixtures.

A new and larger store has been opened by E. G. May in Albany, N. Y., where he carries in stock refrigerators, electric appliances and fixtures. An electric and radio shop is maintained in connection with the store.

Announcement has been made of the opening of a new electric shop in Mardaryville, Ind., by S. L. Sebring.

The Safety Electric Works, Menlo Park, Cal., has been purchased by T. B. Hunnell from the former owner, John Rolla. Mr. Hunnell will do a general electrical business, including motor repairing and installing, house wiring, etc. A full line of appliances will be added to the stock of fixtures and radios now carried.

C. N. Parmenter of Roseville, Cal., has sold his electrical business to Earl N. Holm and R. L. Blake and the new proprietors are now conducting the business under the same name, Franklin Electric Company.

Frank E. Hoy and Sam Belford, formerly with the Electric Construction Company, Findlay, Ohio, have opened a new electric shop under the name Belford-Hoy Electric Shop. Mr. Hoy will be sales director for the new enterprise and Mr. Belford will handle the repair and installation work.

Under the name Valley Electric Company, C. W. Jones and William Rambo have formed a wiring and fixture business in Pomona, Cal. Both men were formerly connected with the Pomona Fixture and Wiring Company, Mr. Jones as manager and Mr. Rambo as superintendent of construction.

New Electragists

The following contractor-dealers have made application and been accepted into the A. E. I. since the publication of the last list in the October issue:

ILLINOIS		Woodstock:	Wyandotte:
Chicago:		E. F. Backhus	Peck Electric Co.
McWilliams Elec. Co., Inc.			
United Elec. Constr. Co.			
		MICHIGAN	PENNSYLVANIA
		Detroit:	Meadville:
		Rapid Elec. Service Co.	Meadville Elec. Supply Co.

News of the Manufacturers

Light Dimmer

The McGill Mfg. Co., Valparaiso, Ind., has just introduced an adjustable "Twi-Lite" cluster, designed for use on table and floor lamps, which provides a wide range of light control from a single pull chain—bright lights, dim lights, and lights out. This cluster is equipped with two wireless composition sockets which rotate 360 degrees and



may be moved to any angle from horizontal to vertical without danger from broken wires, short circuits, or blown fuses. When in the dim position the lamps burn but one-third the current and give one-seventh the light, the manufacturers claim. The adjustable feature of the sockets permits the use of any shape of shade.

Lead Screw Anchors

Star Expansion Bolt Co., New York, and J. Edward Ogden Co., Ltd., Montreal and Winnipeg, Canada, announce a new lead screw anchor device which they call "Scruin". It was designed chiefly to secure greater holding power although requiring a smaller installation hole for the corresponding size screw.



Scruins take more sizes of screws grouped in a more convenient series than older designs. Made in sizes 6-8-10 by $\frac{3}{4}$ in. and $1\frac{1}{2}$ in. lengths, 10-12-14 by 1 in. and $1\frac{1}{2}$ in. lengths, 16-18 by $1\frac{1}{2}$ in., and 22-24 by $1\frac{3}{4}$ in. The manufacturer recommends short lengths when installation is made in good masonry. Long lengths should be used in plaster or other soft surfaced masonry.

Split-Phase Motor

Wagner Electric Corp., St. Louis, Mo., has brought out a new split-phase motor Type 58-RB in $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ H. P. In designing this new motor a new type of split-phase switch was constructed which is made up of two stationary contact fingers, a rotating ring and two simple governor weights. At normal or starting position the contact ring is in contact with the two fingers. This completes the starting circuit. As the motor gains speed centrifugal force causes the governor weights to swing toward the rotor, overcoming the tension strength of the coil spring.

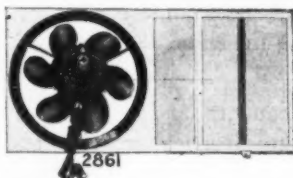
The movement of the governor weights is transmitted to the ring through pivot pins. According to the manufacturer, the new motor is free from grounding, short-circuiting, undue bearing wear, vibration, noise, mounting breakage and other defects commonly encountered in split-phase motors. The motor is described in Bulletin 153.

Period Lamps

The Jefferson Glass Co., of Follansbee, W. Va., has put on the market a line of period lamps, designed along the lines of Early American, Pilgrim and Colonial lamps. One feature of the line is the adaptation of the kerosene lamp type to an electric lamp type. All the shapes familiar to the earlier American home, in combination metal and glass bases, are included. Some designs have fabric shades. All are made in various colors in transparent and opaque glasses and a variety of color combinations is possible.

Transparent Fan Mounts

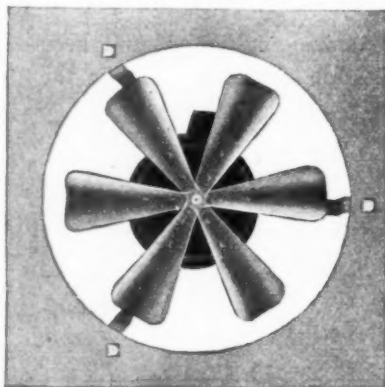
The Emerson Electric Mfg. Co., St. Louis, Mo., has introduced a line of 9- and 12-in. ventilating fan motors with mounting panels having pebbled glass inserts. These are adjustable metal frames with mounting holes drilled and furnished complete with all necessary screws, bolts and nuts. The panel



for the 12-in. fan is adjustable to fit windows from 27 to 37 in. in width. The panel for the 9-in. ventilator is adjustable for windows from 26 to 38 in. in width. The metal portions are finished in light gray. One pane of glass is removable for cleaning the overlapping sections of the glass. These home ventilators have induction motors for 110 volt, 60 cycles only.

Furnace Fan

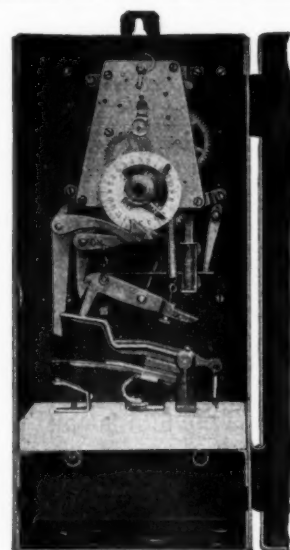
Autovent Fan & Blower Co., announce a new pressure type furnace fan with a new



type electric motor. The manufacturers claim that the new motor is free from the usual vibration or "shimmying". The motor is mounted on a one piece sheet steel panel frame. The accompanying illustration shows front view of the fan.

Time Switch

Robbins & Myers Co., Springfield, Ohio, has taken over the patents of the Meyer Electric Mfg. Co., Houston, Tex., on clock operated time switches and will add this item to its



line of motors and fans. It will be put on the market in a short time under the name of "Lamp-Lighter", which was selected from a list of suggestions from employees of the Robbins & Myers Co.

Flush Receptacles

C. D. Wood Electric Co., Inc., of 565 Broadway, New York City has put on the market a new design of single and duplex flush receptacles, made of Bakelite. The construction is featured by a supporting strap firmly moulded through the Bakelite, for the purpose of making it immovable. The spring contacts, made to take either parallel or tandem caps, are of phosphor bronze and are



fastened into the Bakelite by spun inserts, which, the manufacturer claims, make it impossible for the contacts to shift out of place.

Modern!

Major Products are to be thought of in terms of light fantasies, spellbound audiences and box office profits.

Yet they are substantial, enduring. Profitable every way to the man who specifies them, the man who installs them, and the man who pays for them. They are modern! They are right! They are Major!

Send for bulletins

MAJOR EQUIPMENT CO.
4603 Fullerton Avenue
Chicago

MAJOR

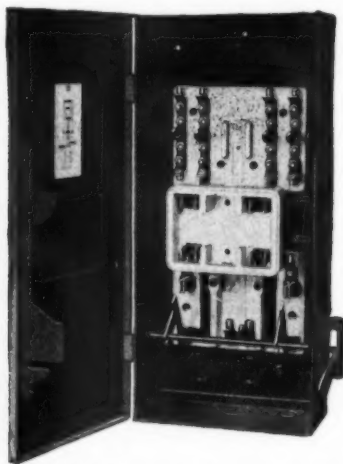


"EVERYTHING ELECTRICAL FOR THE THEATRE"

The slots are bevelled, assisting the insertion of the caps having one prong wider than the other. Long binding head screws, with large heads are furnished and an attempt is made to eliminate the stripping of threads by making the screws with a $\frac{3}{8}$ -in. long threaded bearing surface.

Interlocking Switch

The American Electric Switch Corp., Minerva, Ohio, has placed on the market a new interlocking main fuse accessible switch. The operating mechanism is on the inside of the cover, safe from tampering. It automatically releases the auxiliary cover when the switch handle is moved to the "off" position.



tion. An added feature is the positive service "lock off". Thirty amp. switches are made in 2 and 3 wire, 2 and 4 circuits. Other types and sizes up to 600 amp., single phase or polyphase.

Lighting Fixtures

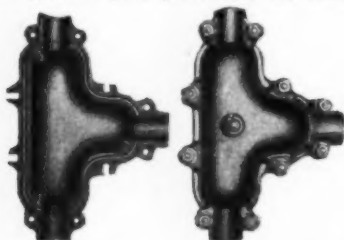
The Lightolier Co., New York, N. Y., has christened their newest lighting fixture "Dinette." The manufacturer designed this fixture especially for sun parlors, dining alcoves, reception rooms or hallways. Dimensions are: extreme width 9 $\frac{3}{4}$ in., length 36 in., body length 18 in.

Auto Transformer

Sorgel Electric Co., Milwaukee, Wis., in a bulletin just issued describes a new type of auto transformer which balances a 110 volt lighting load on a 3 wire, 220 volt system. The primary is 3 phase, 220 volt, and the secondary is 2 phase, 110 volt, 3 wire.

Joint Boxes

The Standard Underground Cable Co., Pittsburgh, has just placed on the market a



new line of two-way, three-way and four-way cast iron split joint boxes for use with either single or multi-conductor cables. Joint

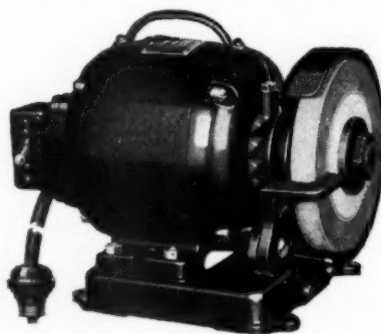
boxes are generally used with armored cables and buried directly in the ground or for installation where a substitute for a lead sleeve is desired. These boxes were designed primarily for airports and were used with park-way cables. The boxes are small and compact, taking up very little space when installed. They are split on the center, the bottom half having a groove slightly larger than the tongue in the top half to accommodate jute packing and the two halves are clamped together by means of bolts which makes the box compound-tight. Filling holes closed by a standard pipe plug are provided. The box clamps around the lead sheath of the cable and also binds the armor of the cable in place.

Interchangeable Sockets

A line of interchangeable porcelain sockets is offered by John I. Paulding, Inc., New Bedford, Mass. The screws are on the outside and when the screws have been loosened the cap is released by pressing the thumb and index finger on the base of the metal clamps. The manufacturer states that the sockets are furnished with pendent $\frac{1}{8}$ in. or $\frac{3}{8}$ in. caps.

Motor Grinder

The Master Electric Co., Dayton, Ohio, has put on the market a new motor-grinder which may be used either as a grinding tool or as



a motor for any purpose for which a $\frac{1}{4}$ H. P. split phase motor is suitable. It can be used as a portable or permanent power unit. It is also made for D. C. for 32, 115 or 230 volts.

Frosted Light Reflector

Reflector & Illuminating Co., 1401-1417 Jackson Blvd., Chicago, are now presenting to the trade a new reflector which is specially adapted for use with 100 watt inside frosted lamps.



This new reflector is for show window lighting purposes and the manufacturers state that photometric tests show that it provides better control of the light than a reflector designed for use with clear bulb lamps.

Manufacturing Notes

The Lightolier Co., 569 Broadway, New York City, has opened a new factory in Jersey City, where it is manufacturing lighting fixtures.

A new bulletin covering air cooled transformers has been issued by the Sorgel Electric Co., 91 West Water St., Milwaukee, Wis.

The Beardslee Chandelier Mfg. Co., of Chicago, is distributing a new edition of its Twenty-four Hour Shipment Catalog, No. S8, replacing Catalog S7 issued in 1925. A number of new designs are listed.

A new factory is being built for the Lexington Electric Products Co., of 419 East 24th St., New York City, in Newark, N. J., which will be opened about January, 1928. A line of moulded composition panel boards will be manufactured.

Herbert Metz, formerly advertising manager for the Graybar Electric Company, has been appointed general advertising and sales promotion manager; E. A. Hawkins is now general supply sales manager; E. W. Thurston has been made telephone sales manager.

Safety Cable Co., 114 Liberty St., New York City, has appointed Edward W. Kearns central district manager, in charge of the Chicago office at 954 West 21st Street, Chicago, Ill.

C. Dent Slaughter has been appointed Pacific coast representative for the Trumbull-Vanderpool Electric Mfg. Co., with offices in San Francisco, Los Angeles, Portland, and Seattle. Alexander Craig, formerly industrial specialist with Morris Blumberg Electric Co., electrical jobbers of Detroit, has been appointed district sales manager for Michigan.

Paul W. Koch & Co., Chicago, Ill., manufacturers of the "Jiffy" line of tools, has appointed the Colonial Electric Co., 40 North 10th St., Philadelphia, Pa., as exclusive distributor for the Philadelphia territory, including Pennsylvania east of Harrisburg and Camden and Atlantic City, New Jersey. Griffith & Henderson, 217 Dickson St., St. Louis, Mo., have been appointed factory representatives in Missouri, Kansas, Nebraska, Oklahoma, and Arkansas.

A southern office of the Wheeler Reflector Company, of Boston, Mass., has been opened at 811 Norris Building, Atlanta, Ga., in charge of R. H. Witherspoon.

Big Cable Merger

The organization of a large electrical wire and cable company under the name of General Cable Corporation is contemplated. If completed it will own the assets and businesses now operated by Dudlo Manufacturing Corporation, Rome Wire Company, Safety Cable Company and Standard Underground Cable Company and the sheet and rod and wire mills of Baltimore Copper Smelting Rolling Company. The corporation expects to retain the executives and staff now managing the various plants. Trade names and good will will also be perpetuated.